



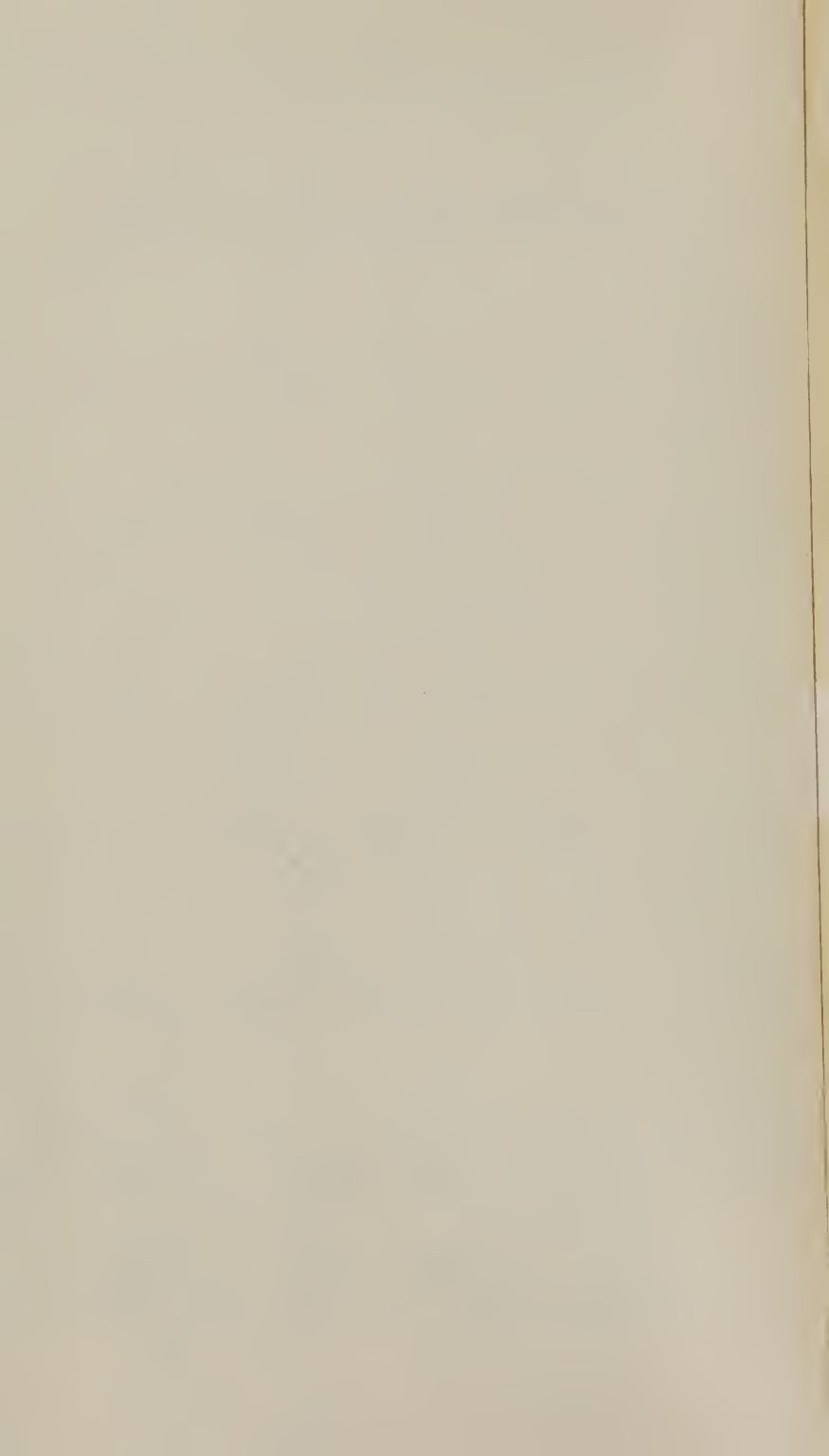
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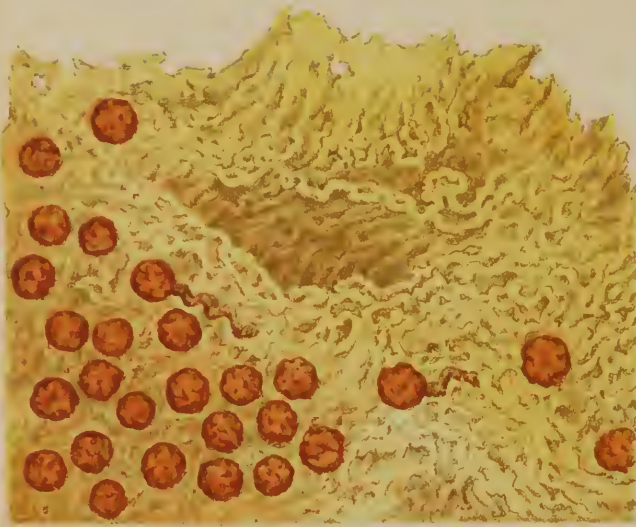
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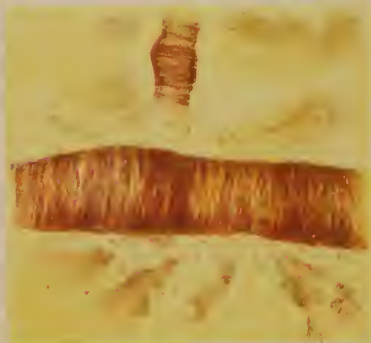




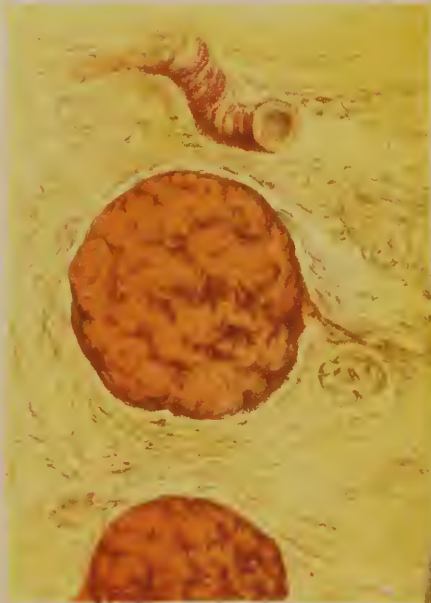
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A PRACTICAL TREATISE
ON
BRIGHT'S DISEASES OF THE KIDNEYS,

BY
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THE ROYAL MEDICAL SOCIETY OF EDINBURGH.

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TO THE MEMORY OF

MY BROTHER,

HUGH GRAINGER STEWART, M.D.

PREFACE TO THE SECOND EDITION.

IN this Edition I have attempted to embody the results of my further study of the diseases which bear the name of Dr Bright. I have not seen reason to modify in any important respect the views formerly advanced, but it is hoped that much additional information, especially in respect of clinical history and treatment, may be found in the present Edition. Numerous illustrative cases have been added, selected from those which have occurred in my practice during the past three years. I have also introduced two additional lithographs illustrative of important pathological conditions.

I have again to express my obligations to Drs Ireland and Argyll Robertson, as well as to my resident Physician Dr Way, for valuable assistance in the preparation of this Edition.

PREFACE TO THE FIRST EDITION.

IN the following pages I have endeavoured to embody the views which I have been led to entertain in regard to the renal affections, commonly included under the term Bright's Disease, or Albuminuria. These views have already been in part laid before the Profession in occasional papers in the medical journals, but it seemed desirable to collect and re-arrange them for practical convenience.

The title "Bright's Diseases" has been chosen because it is desirable to preserve the memory of the illustrious discoverer in connection with his work, and because we can no longer speak of one disease discovered by him, but must recognise several distinct diseases.

I have to record my very grateful thanks to my colleagues in the Royal Infirmary for the permission they have always given to observe and record cases in which I was specially interested. All the cases

not under my own care which appear in this work have, with two exceptions, been already published.

I have also to express my obligations to my friends, Drs Argyll Robertson, Ireland, Gamgee, and Rutherford, who have favoured me with much valuable assistance and advice.

Three subjects of special pathological interest are considered in Supplementary Chapters.

The Plates have been prepared by Messrs Schenck & Macfarlane, from drawings made from nature by Mr Neil Stewart, Mr Weisse, and myself.

25 QUEEN STREET, EDINBURGH,

August, 1868.

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A PRACTICAL TREATISE
ON
BRIGHT'S DISEASES OF THE KIDNEYS.

CHAPTER I.

INTRODUCTION AND CLASSIFICATION.

IN the year 1827, Dr Bright published, in his *Select Report of Medical Cases*, an account of some of the appearances observable on the examination of cases terminating in dropsical effusion, and then, for the first time, specially directed the attention of the profession to certain morbid conditions of the kidney which frequently co-exist with the symptom in question. He showed, further, that a secretion of albuminous urine is frequently associated with the other conditions. Dr Blackall,¹ of Exeter, had previously pointed out that a relationship exists between dropsy

¹ *Observations on the Nature and Cure of Dropsies*, by John Blackall. London, 1814.

and albuminuria, although he had not observed the morbid conditions of the kidney then first described by Dr Bright.² Dr Bright further figured, in a series of plates, unsurpassed in medical literature, some of the conditions of the kidney which he had observed. To the disease thus described the name "*Morbus Brightii*," or Bright's Disease, was applied, and I think it convenient still to retain the term, although it must now be understood to include several different morbid conditions of the kidney, with corresponding symptoms and complications. In order to obviate a misconception which might arise from the use of the term in the singular, and in a generic sense, I prefer to speak of Bright's Diseases.

It is evidently difficult, or almost impossible, accurately to define the term Bright's Disease, but it may be generally described as including the diseases proper to the kidney which are accompanied, at one stage or other of their course, by albuminuria, or dropsy, or by both.

Dr Christison was one of the first to recognise the value of Bright's observations, and to confirm them by his own; and in his work on the Granular Degeneration of the Kidneys,³ published in 1839, he contributed much to our knowledge of the subject. I do not propose to enter upon the somewhat unprofitable topic of the gradual elucidation of this subject,

² Report of Medical Cases, by Richard Bright. London, 1827.

³ On Granular Degeneration of the Kidneys, &c., by Robert Christison, M.D., F.R.S.E., &c. Edinburgh, 1839.

but shall pass on to treat of it as I believe it is at present best understood.

In his "Cellular Pathology" Professor Virchow states,⁴ that as there are three main elements in the kidney, viz., tubules, vessels, and interstitial tissue, so there are three forms of Bright's Disease, one originating in each of the elements. Thus, in the tubules we have what he terms Parenchymatous nephritis; in the vessels, Amyloid degeneration; in the interstitial tissue, Cirrhosis. He justly remarks that these three different forms by no means always appear unmixed, but that, on the contrary, frequently two, and sometimes all of them, exist in the same kidney. As I believe this to be a correct classification, I shall adopt it, with some slight modifications to be presently described.

It may be well, before proceeding further, to indicate and briefly consider the classifications adopted by a few recent authorities.

One of the best recent German writers on this subject, Dr Rosenstein,⁵ of Berlin, conceives that under the term Bright's Disease four morbid conditions are included, viz.:—1st, Congestion from obstructed circulation; 2d, Catarrhal nephritis; 3d, Diffuse nephritis; 4th, Amyloid degeneration. The two former he regards as examples of slight parenchymatous inflammation (Virchow); the two latter, he

⁴ Virchow's Cellular Pathology, translated by Dr Chance, p. 380.

⁵ Die Pathologie und Therapie der Nierenkrankheiten, von Dr S. Rosenstein. Zweite Auflage. Berlin, 1870.

says, are examples of severe parenchymatous changes. It seems to me that this author's first form is not a variety of Bright's Disease at all; that it is unnecessary to distinguish between his second and third forms; and that his fourth has no essential connection with inflammation of the tubules. Moreover, I recognise an important form of which he makes no mention, but which is referred to by Virchow, and has been the subject of careful study in this country, viz., the affection of the interstitial tissue, the disease commonly called contracting, cirrhotic, or gouty kidney.

It may be necessary to say a few words in vindication of these opinions, and in explanation of Dr Rosenstein's views. First, then, with regard to his sub-divisions of the parenchymatous form. His first variety is, *Bright's Disease from congestion, a result of embarrassed circulation*. He agrees with Traube in regarding this as an "affectio sui generis," and not identical with the first stage of diffuse nephritis. The amount of urine is diminished, while the solids are natural. The specific gravity is therefore high, and sediments are readily formed. From pressure on the veins, albumen appears in the urine, and this comes and goes according to the degree of embarrassment of the circulation. In cases of long standing, the anatomical characters of the kidneys are as follows:—Their volume is increased, rarely somewhat diminished, the consistence dense, the capsule easily separable, the surface mostly smooth, sometimes with little patches

of depression; on section, the cortical substance is usually thick, reddish, or grey, the cones are red, but at the apices generally pale. On microscopic examination, the malpighian bodies appear mostly natural, sometimes a little atrophied; the connective tissue is occasionally found increased, its nuclei abnormally numerous; the epithelium is granular, sometimes fatty, and frequently contains pigment; while the veins, particularly the small ones, are much dilated. Such conditions occur occasionally in heart disease, pulmonary affections, and in pregnancy. I have examined *post mortem* a very large number of cases of this kind, and have, as a rule, found no evidence of true inflammation; the pathological conditions, as well as the symptoms present during life, depending entirely upon hindrance to efflux of blood from the organ, and being apparently of such a nature as to disappear readily if that hindrance could have been removed. It is true that in cases of some standing an induration of the organ occurs, and the surface sometimes becomes granular, the connective tissue being somewhat increased, and that in a very small proportion of instances a true inflammatory action co-exists with, and is doubtless aggravated by, the cardiac or vascular obstruction. But it does not follow that the inflammation results from the obstruction; indeed, the fact that its occurrence is the exception, and not the rule, goes strongly against such an inference. But admitting that we have not in such cases to do with inflammation of the tubules, it might

be supposed that the slightly granular surface, with increase of the connective tissue, indicates the early stage at least of another form of Bright's Disease, viz., the cirrhotic or contracting; such a supposition, however, is opposed both to the facts observed and to the analogy of disease in other organs. As to the facts observed, the anatomical characters of the kidney in this condition are very different from those met with in true cirrhosis; and while I have never seen a kidney altered by obstructed circulation approach in appearance the advanced cirrhotic condition, I have never been able to find proof that the advanced cirrhosis was in any instance due to congestion. As to the analogy of disease in other organs, I would refer to the marked difference between true cirrhosis of the liver, a disease due to a morbid condition of the connective tissue, and the spurious cirrhosis, which results from congestion. Thus I incline to put this form out of the category of Bright's Disease altogether.

With regard to his second variety, the *catarrhal nephritis*, I think that it is not properly distinguishable from his diffuse form, and that it occurs in a much greater variety of cases than has been usually supposed. The following is an abstract of the account of it given by Rosenstein:—The pathological appearances are not such as to attract attention; the organ is of normal size, or slightly swollen, in the more severe cases congested, and with ecchymotic spots scattered throughout its substance; the affection begins at the apices of the pyramids, which are at

first congested, but afterwards pale, the pallor depending upon the accumulation of swollen epithelium within the tubules. The cortical substance, and especially the parts of the tubules next to the malpighian bodies, often remain free from disease. The stroma in many cases is increased in volume. The symptoms, also, are by no means prominent, consisting merely of the occurrence of albumen, mucus, and tube-casts in the otherwise natural urine; the casts are epithelial and hyaline, and sometimes contain blood corpuscles, pigment-granules, and crystals of oxalate of lime. The malady originates under a considerable variety of circumstances,—from exposure to cold, from extension of inflammation from other parts of the urinary tract, from the presence in the blood of irritating substances, such as cantharides and cubebs, from fever poisons, and in connection with cholera. Such is, in outline, Rosenstein's account of catarrhal nephritis. It appears to me that he has failed to draw a sufficiently clear line of distinction between his catarrhal nephritis and the inflammatory form of Bright's Disease, either in its causation, symptoms, or morbid anatomy. Most of the causes enumerated by Rosenstein would, if intensely or continuously applied, unquestionably lead to what all recognise as inflammation of the kidneys. The symptoms, too, are such as would be met with in a mild case, or in an early stage of inflammatory Bright's Disease. And, lastly, we meet with the same morbid lesions as in ordinary inflammation, to wit, an infiltration and cloudy swel-

ling of the epithelium of the tubules. It is true that in what may be called typical cases of inflammatory Bright's Disease, neither the number and extent of the tubules affected, nor the period in which the changes take place, are precisely the same; but a similar variety exists in the same conditions in acknowledged diffuse inflammation, as well as in what is called catarrh. Thus, in respect of morbid anatomy, symptoms, and causes, this affection seems to be undistinguishable from inflammatory Bright's Disease.

Of Rosenstein's *diffuse nephritis* it is unnecessary to say more than that it corresponds to Virchow's parenchymatous form, and to what I shall term the inflammatory form of Bright's Disease.

He rightly distinguishes the *amyloid affection*, although his conception of it differs materially from mine; but, as has been already said, he takes no notice of a form which Virchow had recognised, and which, though rarer, unquestionably does occur, the *contracting or cirrhotic kidney*.

As examples of the views of classification prevalent among British authors, I select those of Johnson, Goodfellow, Bennett, Aitken, Roberts, and Dickinson.

Dr Johnson,⁶ to whom the profession is indebted for valuable discoveries in regard to renal disease, classifies the forms of Bright's Disease as follows:—

⁶ Diseases of the Kidney, by Dr George Johnson, 2d ed. London, 1866.

1. Acute desquamative nephritis. 2. Chronic desquamative nephritis. 3. Waxy degeneration of the kidney. 4. Non-desquamative degeneration of the kidney. 5. Fatty degeneration of the kidney.

Dr Goodfellow,⁷ whose work is valuable as embodying the experience of an excellent practitioner and clinical observer, considers the maladies referable to the following classes:—1. The large white kidney, which has two stages, that of acute inflammation, and that of chronic exudation, often attended by fatty degeneration. 2. The red contracted kidney. 3. Mixed forms. 4. The lardaceous, waxy, or amyloid kidney. 5. The fatty kidney.

Professor Bennett⁸ describes three forms:—1st, Inflammatory, which may be acute or chronic; 2d, The waxy degeneration; and 3d, The fatty form.

Dr Aitken⁹ distinguishes two varieties of inflammation of the kidney—viz., the Parenchymatous, in which the tubules, and the Interstitial, in which the stroma, is affected; and in another part of his work he mentions several other forms of disease—viz., the large white kidney, the small contracted kidney, mixed forms, fatty, and amyloid degenerations.

⁷ Lectures on Diseases of the Kidney, generally known as "Bright's Disease," and Dropsy, by S. J. Goodfellow, M.D., London. London, 1861.

⁸ The Principles and Practice of Medicine, by J. Hughes Bennett, M.D. Edinburgh, 1865.

⁹ The Science and Practice of Medicine, by William Aitken, M.D. London, 1863.

Dr Roberts,¹⁰ in his valuable book on Urinary and Renal Diseases, distinguishes between acute Bright's Disease and chronic, and divides the latter class into three varieties—viz., the smooth white kidney, the granular red kidney, and lardaceous or waxy kidney.

Dr Dickinson,¹¹ in his work published after the greater part of the first edition of this treatise was written, describes three forms of Bright's Disease, viz.:—1. Tubal nephritis, which never passes on to present the atrophied granular rough appearance. 2. Granular degeneration. 3. The depurative, waxy, or amyloid form.

Dr William B. Lewis¹² of New York gives the following classification with synonyms:—1. Tubal nephritis, also called *acute desquamative nephritis*, *acute diffuse nephritis*, *the inflammatory form of Bright's Disease*, *croupous nephritis*, and *acute Bright's Disease*. 2. Granular degeneration, also called *chronic desquamative nephritis*, *parenchymatous nephritis*, *the cirrhotic or contracting form of Bright's Disease*, *the gouty or fibroid kidney*. 3. The *Waxy depurative, amyloid, or lardaceous disease*.

Thus all these writers recognise clearly the more important varieties of the malady; but well as they

¹⁰ A Practical Treatise on Urinary and Renal Diseases, &c., by William Roberts, M.D. London, 1865.

¹¹ On the Pathology and Treatment of Albuminuria, by W. H. Dickinson, M.D., Cantab. London, 1868.

¹² The Pathology of Bright's Disease. New York, 1869.

have described the diseases, I hope in the following pages to bring out certain points in the pathology and clinical history which they have overlooked, and which appear to me of considerable importance. It will be better to defer the discussion of these points until we have to deal with them in detail, and shall now only indicate the classification which is to be the basis of the present treatise.

We shall now consider successively—

1. *The inflammatory form*, of which there are three stages—

a That of inflammation.

b „ fatty transformation.

c „ atrophy.

2. *The waxy or amyloid form*, of which also there are three stages—

a That of degeneration of vessels.

b „ secondary changes in the tubes.

c „ atrophy.

3. *The cirrhotic, contracting, or gouty form*.

CHAPTER II.

THE INFLAMMATORY FORM.

MORBID ANATOMY.

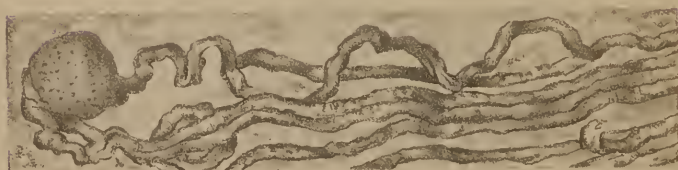
THE inflammatory form of Bright's Disease is an affection sometimes of short, sometimes of long, duration. When it runs through its whole course the kidney undergoes a series of changes which may, for convenience in description, be divided into three stages, each characterised by very distinct anatomical characters, viz.—*1st*, that of inflammation; *2d*, that of fatty transformation; and *3d*, that of atrophy. I shall now describe these in their order.

1st, The stage of inflammation.—The organ is of the natural size, or somewhat larger; its capsule is unaltered, and strips off readily; its surface is smooth, more or less congested, often pink, it is sometimes of a dark purplish colour, sometimes mottled, pale and purple. On section, the cortical substance is relatively somewhat increased in volume. It is often congested, the malpighian bodies standing out prominently from the surrounding tissue, the congested vessels separated by a varying amount of white (somewhat opaque) deposit, composed of the altered

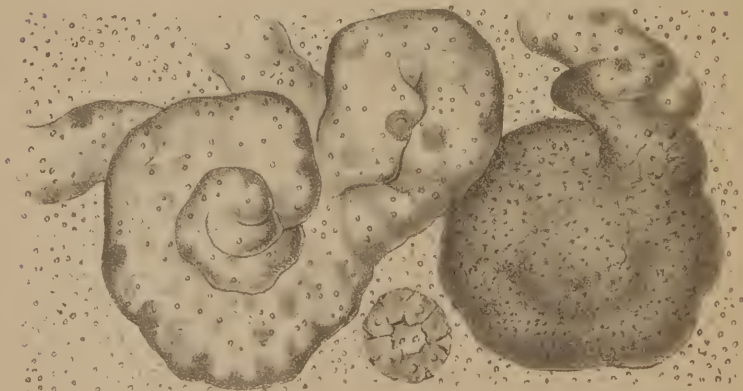
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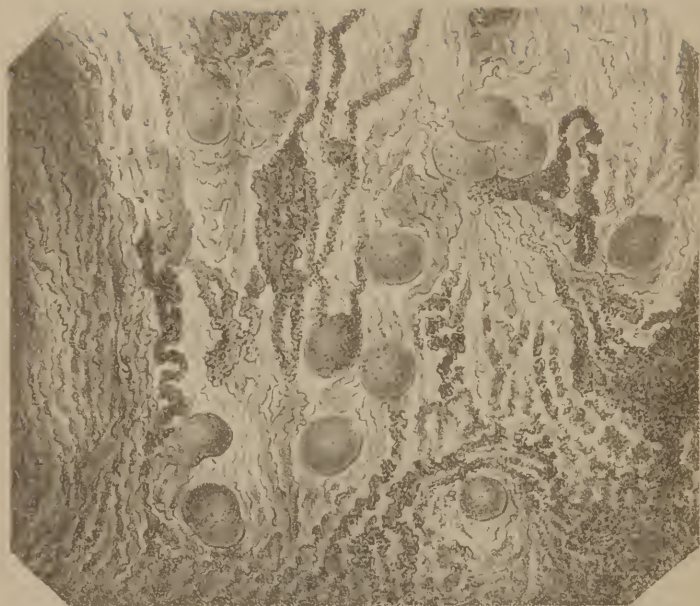
tubules, to be presently described. The vascular spaces between the cones and the cortical substance are uniformly distended with blood, the cones are usually redder than the cortical substance, and from the engorgement of their vessels, and the altered condition of their tubules, they present a series of alternating red and white lines, converging to the apex of the cone, at which point the white distinctly predominate. The pelvis of the kidney is natural.

On microscopic examination with a low power, the congestion of the vessels and the alteration of the tubules become more distinct; the vessels are, for the most part, gorged with blood. The malpighian bodies appear as if injected with red material, or what is more common, they appear dense and opaque, of an ashen grey colour. In the earliest period of the inflammation the former condition occurs; in the more advanced period the latter. Many of the tubules, especially those of the cortical substance, appear darker and denser than natural; they sometimes appear as solid bodies, sometimes as tubes, with thickened and somewhat opaque walls. In the groups of tubules passing down towards the cones, and in the cones themselves, individual tubules here and there are affected like those of the cortical substance, and contrast strikingly with their neighbours which are unaffected.—*Plate I, figs. 1 and 2.* On examination with a higher power (300 or 400 diameters), the malpighian bodies appear dense and granular; and where the tubules expand to receive

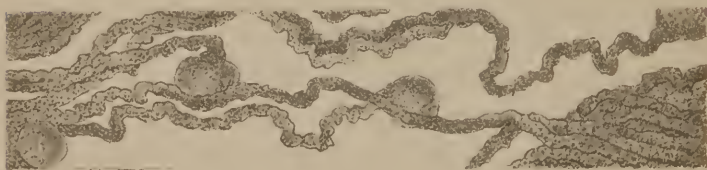
the tuft of vessels, swollen and granular cells may be seen. The tubules are more bulky than natural, their epithelium is swollen, granular and dense, the cell wall indistinct, and the nucleus frequently imperceptible. On examining a transverse section, this enlargement of the epithelium becomes very apparent, for the cells are large and granular, and the lumen is greatly reduced, or altogether lost. In the tubules so altered, a transparent homogeneous material is frequently seen, which fills up the lumen of the tube, and binds together, or, so to speak, cakes into one mass, the epithelium of the tubules; not unfrequently blood corpuscles are associated with this exuded matter.—*Plate I, fig. 3.*

Such are the characters of a typical specimen of this condition. Numerous varieties are met with—varieties in the *portions* of the tubules affected, for it may be those next the malpighian bodies, or more especially those passing to the cones; in the *amount*, for it may affect the great mass of the organ, or a comparatively small portion; in the *character*, there being a greater or less tendency to rapid desquamation of the epithelium; in the *time* occupied by the diseased condition, for it may come on slowly or with great rapidity.

In many cases, happily, recovery takes place at this stage of the disease by gradual cessation of the inflammatory action and removal of exuded matter, but in others it goes on and leads to the second stage, which I now proceed to describe.



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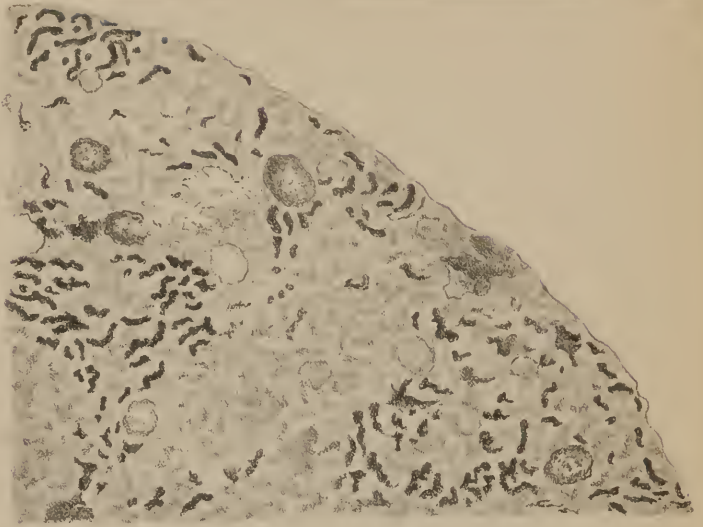
2d, The stage of fatty transformation.—In this stage, to which the term “large fatty kidney” is commonly applied, the inflammatory process has passed away, or, as is more common, become chronic, but its effects remain. The organ is enlarged; its capsule is natural, easily stripped off; its surface is smooth, or slightly depressed here and there. It is pale and fatty in colour, and on its surface stellate vessels are frequently conspicuous. The colour is peculiarly mottled from the mingling of opaque sebaceous-looking fatty portions with the whitish more translucent tissues natural to the organ. On section, the cortical substance is pale, of a yellowish-white colour, and increased in volume, while the cones are pink, and of natural colour and size. The malpighian bodies do not project prominently, as in the first stage. On closer inspection, the sebaceous-looking parts may be seen to correspond to distended convoluted tubules, and not unfrequently lines of this material may be seen running between the small arteries toward the cones.

On microscopic examination with a low power (50 diameters), the tubules are seen in many parts distended with a black untransparent material; this is most marked in the convoluted, but in the straight tubules, here and there individuals or groups may be found affected. The malpighian bodies are enlarged, but not prominent; and while they may be finely granular, never present the black appearance of the tubules.—*Plate II, figs. 1 and 2.* Under a higher

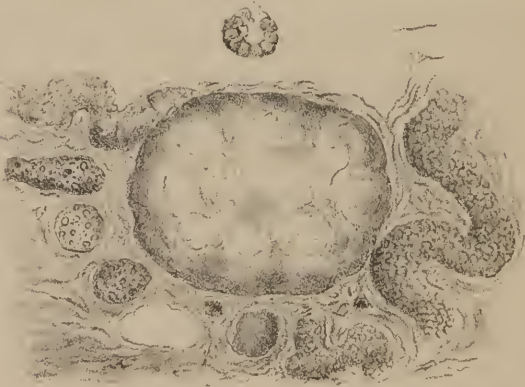
power (300 to 400 diameters), the distended tubules are seen to be filled with fatty granules, which, for the most part, are contained within the walls of epithelial cells, which again are embedded in a material that blocks up the tubules. The tubes are, moreover, found to be irregularly distended, in some parts much dilated, in others narrow, or of the natural calibre. In the malpighian bodies, oil globules and fatty cells are frequent, but the capillary tuft is unchanged. The parts in which the fatty condition is revealed by the microscope correspond to those in which the dense sebaceous looking material is seen by the naked eye.—*Plate II, fig. 3.*

3d, The stage of atrophy.—The organ is diminished in bulk and weight; its capsule is natural, although less easily torn off than in health; on its removal, the surface is found to be uneven, numerous depressions alternating with elevations. A few stellate vessels are usually seen here and there. The colour is, as in the second stage, mottled; but there is a greatly smaller proportion of the sebaceous-like untransparent matter than exists in it. On section, the diminution of bulk is found to have been mainly or exclusively at the expense of the cortical substance; that while the cones remain nearly of their natural size, the cortical substance is small and atrophied, and that which intervenes between the cones is greatly diminished. Not uncommonly a deposit of adipose tissue has taken place about the pelvis.

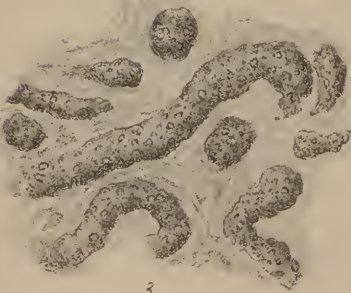
1.



2.



3.



4.



In the cortical substance, the malpighian bodies are not prominent, the dense sebaceous-looking matter exists in quantity, but not so abundantly as in the second stage, while the vessels, and especially the arteries, are thicker and more prominent. On microscopic examination under a low power (50 diameters), we at once remark the unusual prominence of these arteries, and thickening of their walls, the relative increase of the fibrous stroma of the organ, and the occurrence of dense dark matter in portions of convoluted tubules; but many of the tubules are shrivelled, atrophied, closed, and the exuded material lies here and there in scattered patches. Many of the malpighian bodies, much reduced in size, are surrounded by a rather thick sheath of fibrous structure. They do not constitute prominent objects, and their size varies remarkably.—*Plate III, fig. 1.* By higher powers (300 to 400 diameters) we ascertain more distinctly the points to which we have referred, and make out that the black material contained in the tubules is the same as that seen in the second stage.—*Plate III, fig. 2.*

It must be apparent to any one familiar with the morbid anatomy of the kidney that the organ in the third stage of the inflammatory form closely resembles the cirrhotic or contracting kidney. Indeed, so close is the similarity, that many observers have failed to distinguish between them. Their failure has resulted in two kinds of error,—some crediting the cirrhotic forms to the disease of the tubules, others referring

the inflammatory cases to cirrhosis. This necessarily induces many inaccuracies as to the clinical history attached to supposed examples of one or other process. Careful clinical observation, as well as a study of the pathological appearances met with in different cases, seem to me to prove that the granular atrophic condition results from inflammation of the tubules as well as from cirrhosis. The pathological distinction depends mainly upon the condition of the tubules and the relative amount of connective tissue. When the atrophy is a consequence of inflammation, many of the tubules exhibit evidence of the inflammatory action; they are occupied by exudation and epithelium in process of fatty degeneration, while in the cirrhotic there is little or none of this. Moreover, on close examination it is found that the tubules so blocked up are met with in all stages of atrophy, diminished in size, and angular instead of rounded in form; while I have seen none free from exudation undergoing a similar change. On the other hand, in the cirrhotic the fibrous stroma is greatly increased, while in the inflammatory it is certainly relatively more abundant than in health, but by no means to such an extent as in the other affection. The capsule also is more easily stripped from the surface in inflammatory than in contracting cases, and cysts are much more common in the latter than the former.

How are these different stages related to one another? The first stage is that of inflammation, in which exudation is poured out, and a destruction of

the epithelium takes place. This exudation, affecting a large number of tubules, leads to enlargement of the organ, and also to fatty degeneration of the epithelium; its absorption or removal leads to ultimate atrophy.

The first of these statements requires no comment, but it may be well to offer a few remarks regarding the connection of fatty degeneration and atrophy with inflammation, which is of considerable pathological interest. The fatty degeneration, in particular, has attracted much attention, and is well worthy of discussion here; but as I am unwilling to cumber my text with dissertations not essential to the purpose of the work, I prefer to deal with the subject in a supplementary chapter at the end of the volume. I would only in this place remark, that while fatty degeneration undoubtedly results from inflammation, and constitutes one of the most prominent features of its more advanced stages, it also occurs in the other forms of Bright's Disease, and is often exceedingly pronounced in cases not referable to this category at all, not being associated either with albuminuria or dropsy. This being the fact, it is very clear that the expression "Fatty kidney," which still appears in many of the text books as a name for the second stage of the inflammatory form, should be abandoned.

With regard to the atrophy-ultimately resulting from the inflammatory process, it appears to be induced by molecular absorption of the exuded and degenerated material occupying the tubules. This is

analogous to what is seen in similar diseases of the liver, and the facts which I have stated above seem to be explicable only on this hypothesis. The uneven surface is due to the irregular affection of the tubules, some being involved and undergoing atrophy while others escape; and it appears to me that the granulations in this form of disease are due to the formation of depressions by absorption of tubule-contents rather than to contraction or outgrowth of connective tissue.

The disease may prove fatal at any stage of its course. Patients not unfrequently die in the first stage; rather more commonly in the second; but many live till the third stage is well advanced. Recovery happily often takes place after the first stage; complete recovery sometimes occurs, and partial recovery is common, after the second; and even during the third stage a considerable immunity from unfavourable symptoms may be enjoyed. As to the time required for passing through these different stages I cannot speak positively; it is obvious that the duration must vary according to the character of the first stage. I have seen the second stage typically developed within three months of the commencement of the disease, and I have found the third stage well marked within a year of the occurrence of the earliest symptoms.

CHAPTER III.

THE INFLAMMATORY FORM.

CLINICAL HISTORY.

AFTER exposure to cold and wet, or, it may be during or after an attack of scarlatina, erysipelas, or other febrile affection, or without apparent cause, an individual feels some lumbar pain, has frequent calls to micturition, but makes little water at a time, and that of a dark bloody or smoky colour, containing a large amount of albumen, and throwing down a deposit composed mostly of tube-casts. The total quantity of urine is much diminished. The face, the legs, or the scrotum, or all of them together, become œdematous, and the œdema more or less rapidly increases and extends. There is at the same time some degree of febrile disturbance, the breathing may be interfered with, and the patient may complain of headache and drowsiness. On microscopic examination of the urinary sediment it is found composed mostly of tube-casts, and these present considerable variety of character. Some consist entirely of granular epithelium, such as is commonly seen in the tubules of the kidney. Others are granular, the outlines of the cells recognisable only on very careful examination. Others contain more or less hyaline material mingled with and connecting together gran-

ular cells. And, lastly, some are found in which blood corpuscles, in varying quantity, are present. Along with the tube-casts, and sometimes in large quantity, are found blood corpuscles, altered by the action of the fluid in which they have lain.

In the most favourable cases these symptoms continue for a few days, or for a week or two, and then gradually subside; the urine first improving; its quantity increasing, its colour becoming more pale; the albumen and the tube-casts diminishing; and the dropsy passing away by degrees.

But in a large proportion of cases the symptoms first referred to increase in intensity, or after temporary improvement a relapse occurs, the dropsy becomes so severe as to prevent the free play of the lungs, and death from suffocation results; or the blood becoming poisoned with excrementitious matter, which the diseased kidneys are unable to eliminate, a series of nervous symptoms, varying in their character, though at present grouped under the name uraemia, results, under which the patient dies.

Such are the most favourable and the most unfavourable terminations of inflammation of the kidneys. It must be borne in mind that in a large number of cases where the first stage of the disease exists, death occurs not merely from the renal malady, but from the combined influence of it and previously existing disease. In such cases the fatal result sometimes takes place before dropsy is developed. In others the dropsy is distinct, but not very prominent.

The quantity of urine is diminished in all, and the water contains more or less albumen, while granular and hyaline casts may be found in the sediment which it throws down.

In a large proportion of cases, instead of complete recovery or death, the symptoms assume a more chronic character;—the quantity of urine rises, its general quality improves, it becomes paler, less albuminous, and entirely free from blood; it still deposits tubercasts, but their quantity is diminished, and their character is changed. They contain cells, which, however, are no longer finely granular, but loaded with fat, and in many cases so numerous as to give the whole cast the appearance of being composed of fatty granules. Others are hyaline, with fatty cells imbedded in them, and yet others are simply hyaline in appearance. At the same time the dropsy does not diminish, or alternately rises and falls, the patient lingers on for weeks, or even for some months, the dropsy at length gains ground, ascites becomes more copious, the lungs become oedematous, or hydrothorax occurs, and death may result from these causes. On the other hand, nervous symptoms may predominate, the patient becomes drowsy and listless, sinks into a state of coma, perhaps with convulsions, and so dies.

Happily, even cases which have advanced to this stage frequently present more favourable terminations. The urine having increased greatly in quantity, the dropsy gradually disappears, the amount of albumen in the urine diminishes, that of urea increases, and

often a patient is enabled to return to the ordinary duties of life, presenting no unfavourable symptom, excepting albuminuria. Nay, even that may disappear, and the health be entirely restored.

But in other cases, though death does not ensue at once, the recovery is very imperfect. The urine is pale, in good quantity, contains a moderate amount of albumen, and throws down a slight deposit of tube-casts, which are mostly hyaline; but the dropsy, or at least a tendency to it, is never wholly gone, the patient cannot return to work, or, if he does, he has a relapse, and sooner or later his symptoms become aggravated, and he dies with increase of dropsy, or with uraemia, almost constantly with diminution of urine. On the other hand, an intercurrent attack of acute disease may prove fatal. In such cases we find atrophy, more or less advanced.

In this sketch of the Clinical History of the malady I have referred only to the essential symptoms, and not to the interesting and peculiar complications which appear during its course, passing over varieties which are rarely met with.

In illustration of the Clinical History thus given in outline, I select the following cases :—

Cases Illustrative of the First Stage.

(a) TERMINATING IN RECOVERY.

CASE I.—*Acute nephritis; recovery.* A. D., a baker, æt. 30, was admitted to the Royal Infirmary, under the care of Dr

Laycock, November 5th, 1859. The patient stated that he had always been healthy until October 18th, when he caught a severe cold. On November 1st he observed that his face, and afterwards his body and extremities, became swollen. The œdema gradually increased until the date of admission.

He was then intensely œdematous. His urine was scanty, about two ounces in the day, of a pale straw colour, highly albuminous, with a considerable sediment, consisting mainly of granular tube-casts.

Under treatment by dry cupping, diuretics, &c., he soon improved. The urine increased in quantity, the albumen diminished, and the dropsy gradually disappeared. He was dismissed, apparently quite well, November 25th.

Commentary.—In this case the malady resulted from exposure to cold, and under treatment he completely recovered within a month of the commencement of his illness. The symptoms, although well marked, were never very severe, and no complication arose in the course of the malady.

CASE II.—*Sub-acute nephritis, resulting from cold ; recovery.*
J. R., æt. 23, washerwoman, born in Newhaven, resident in James Street, was admitted to the Royal Infirmary under my care November 5th, 1870, complaining of swelling of feet and face, with shortness of breath. She had been ill for a fortnight.

History.—She has been in general healthy, but is hard worked, and exposed to vicissitudes of temperature. She had noticed for a twelvemonth past that her feet swelled occasionally—especially during menstruation. The present illness commenced three weeks ago, and resulted, she thinks, from hard work, and exposure to heat and cold alternately in washing clothes and afterwards taking them to a green to dry. She felt chilly, and had slight shiver-

ings. A day or two later she noticed her face swelled, and her breathing short. She applied to a dispensary, but being obliged to continue at work, she derived no benefit from the prescriptions, and therefore came to the Infirmary.

On admission.—She was pale and dropsical.

The *Alimentary* and *Circulatory Systems* were normal.

Integumentary System.—There was no trace of eruption. The face, feet, and legs were somewhat œdematous.

Urinary System.—She had a good deal of pain in the small of the back before she came to the infirmary. The urine is in small quantity, of amber colour, sp. gr. 1015, albuminous.

Treatment.—She was ordered 15 minims of tincture of digitalis, and 20 grains of nitrate of potash, three times a-day. Under this treatment she rapidly improved—the urine rising to its natural amount, the albumen and dropsy disappearing. On the 20th of December she left the Infirmary in perfect health.

Commentary.—This case affords an example of the sub-acute form of the disease, resulting from exposure to cold, uncomplicated throughout its course, and terminating in complete recovery.

CASE III.—*Inflammation of kidneys following scarlatina; suppression of urine; cupping over the loins; recovery.* Hugh Bryden, æt. 8, was admitted to the Royal Hospital for Sick Children, under my care, March 2d, 1867.

Soon after admission a scarlatinal eruption appeared. The case was mild, and all went on well for three weeks, when the patient was seized with symptoms of acute nephritis. He was treated with hot air baths and diuretics, and soon began to improve, although the urine did not return to its normal quantity and quality, continuing to be dark in colour, and to deposit albumen. On the 14th of May, however, he became flushed, and

began to complain of pain in the abdomen, and to vomit a thin greenish matter. There was no increase of dropsy, but the pulse was rapid, weak, and irregular, and there was slight dulness at the base of the right lung posteriorly. His urine was bloody, and greatly diminished in quantity, being only two ounces in twenty-four hours. By five P.M. on the 16th he had become comatose, and his breathing was of a stertorous character. He was then cupped over the right loin by the resident physician, Mr Perkins, and an ounce and a half of blood was drawn, with the effect of producing speedy and marked relief. On the 17th he was much more lively, answered questions, the sickness was relieved, and he passed twenty-two ounces of urine. Ordered five grains of acetate of potash thrice a-day. On the 18th he passed thirty ounces of urine, which contained albumen and granular casts, with a few blood and pus corpuscles. On the 20th the urine was much clearer, casts and blood diminished, albumen about the same as before. On the 21st he was much better, urine greatly improved, the quantity of albumen decreased. On the 22d the urine was almost normal, only a small quantity of albumen being present. The general symptoms improved. On the 24th not a trace of albumen remained in the urine; and on the 1st June the patient had so far recovered that he was permitted to leave the hospital, at his mother's request.

Commentary.—This case of post-scarlatinal nephritis was at first somewhat mild, although sufficiently distinct; but on the 14th of May, probably after some exposure, suppression of the urine occurred, with severe vomiting and congestion of the base of the right lung, and I believe that, but for the timely interference of the resident physician, a fatal result would soon have ensued. The after treatment was by means of mild diuretics, and the recovery was complete.

CASE IV.—*Inflammation of kidneys following measles; recovery.* Jane Gibson, æt. 4, was admitted to the Royal Hospital for Sick Children, under my care, May 13th, 1867.

The patient had been admitted into the Hospital on the 28th of April suffering from measles, and was discharged convalescent on the 10th May, which was cold and wet. Almost as soon as she got home she was taken ill with shivering, the skin being at the same time very hot. This continued till the 13th, when she was again admitted. For the first few days nothing could be made out farther than that she was more than ordinarily drowsy; but on the 23d her feet were noticed to be swelled, and she complained of pain in the loins. The urine was small in quantity, dark in colour, and contained albumen. A poultice was applied to the back, and she was ordered a diuretic and diaphoretic mixture.

On the 24th of May she passed only 11 ounces of water. On the 25th she passed 8 ounces, containing a large amount of albumen, with granular casts and a little blood. On the 29th she was much better. Passed 22 ounces of urine with less albumen. On the 30th the urine was 29 ounces, with a very slight trace of albumen. 12th June.—The patient has gone on favourably, and was to-day discharged quite well.

Commentary.—In this case, which came on insidiously after measles, and was never very severe, I relied simply upon the fomentation over the loins, and the diuretic and diaphoretic mixture. The result was quite satisfactory.

CASE V.—*Inflammation of kidneys following diphtheria; recovery.* J. H., æt. 27, unmarried, a medical student, resident in Edinburgh, was seen by me on July 6th, 1871. He complained of œdema of the eyelids and face, and general debility, and had been ill for a fortnight.

History.—About fourteen days ago he caught cold, and two days later had a severe headache and sore throat; he went to bed, and diphtheritic patches gradually formed on the tonsils and pharynx. Under treatment, by means of iron and chlorate of potash internally, with sulphurous acid and Condyl's fluid to the throat, he recovered, and his throat is now well; but within the last few days his face has begun to swell, and he feels weak and giddy on rising. He is tall; of a dark complexion; bilious temperament; temperature 98·5.

Alimentary System.—Lips dry; tongue covered with a thin white fur; appetite bad; he is troubled with flatulence; the bowels are regular, but inclined to constipation. Last night he vomited a quantity of liquid; but has had no return of the sickness to-day.

Circulatory System.—Systole of the heart rather prolonged; pulse 72, regular, but somewhat weak; otherwise normal.

Respiratory System.—Normal.

Integumentary System.—Skin dry, but sweats at night; he has a papular eruption on the face, and partially on the arms and chest; there is considerable oedema of the eyelids and face generally.

Urinary System.—No lumbar pain; urine diminished in quantity; amber coloured; sp. gr. 1017; reaction acid; it deposits a sediment of phosphates on standing, and is loaded with albumen, becoming nearly solid on the addition of nitric acid.

Treatment.—Hot poultices to the loins, and the following mixture:—

R. Spiritus etheris nitrosi, ʒvj.
 Inf. digitalis, ʒjss.
 Syrupi simplicis, ʒss.
 Aquam ad, ʒvj.

Misce.

Sig.—A table spoonful three times a-day.

July 7th.—Pulse 68; face swollen; urine contains as much albumen as yesterday. He had a little sleep this morning from 4 o'clock, but none during the night.

July 8th.—He took a draught containing 25 grains of chloral, but only slept two hours, in consequence of facial neuralgia.

July 9th.—Face much swollen; neck also beginning to swell; had tic at night; took 40 grains of chloral; slept all night and till noon next day.

July 10th.—Was very sick and faint, and in a semi-conscious state until mid-day; neck much swollen.

July 11th.—Had a good sleep after taking a chloral draught; urine unchanged (9-10ths albumen).

July 12th.—(Edema has disappeared from the face, and now affects the neck; pulse 84, weak; appetite improved.

July 13th.—Drowsy and stupid until mid-day; the soft palate and fauces are cedematous; voice hoarse; pulse 88; the tongue is covered with a thick brown fur, moist, swallowing not affected; digitalis mixture stopped, and 3ss bitartrate of potash, thrice daily, substituted; no draught at night.

July 14th.—Slept until 10 A.M., and awoke much refreshed. The chest is rather cedematous, and there is some fluid in the abdomen; the swelling of the neck has almost disappeared; the urine is less albuminous (7-10ths); pulse 104 at night, but this was after exertion; average pulse 90; was up for about two hours at mid-day; abdomen distended; no draught.

July 15th.—Tongue clean and moist; pulse 80; general health much improved; urine improving ($\frac{1}{2}$ albumen); had six hours' good sleep without anodyne.

July 16th.—Had a good sleep, but felt dull all day; neck slightly swollen; pulse 90.

July 17th.—Urine alkaline, and in good quantity (albumen 4-10ths); poultices have been kept on regularly for last three days.

July 18.—Treatment changed, potass stopped, and citrate of iron and quinine substituted. Urine plentiful, and albumen diminishing (about one-fifth).

July 19.—Going on well, albumen down to one-tenth.

July 20.—Slight increase in quantity of albumen, but general health still good. The patient was out for a drive.

July 21.—Albumen still increasing. Tincture of iodine to be painted over the kidneys twice daily, and the citrate of iron and quinine changed for the compound syrup of the phosphates.

July 22.—Albumen still slightly on the increase. The patient was out for a short walk; his general health is good, and his appetite is excellent. Treatment continued.

July 23.—Albumen increasing (about one-fourth), quantity of urine still good, general health and appetite fair.

24th.—Albumen less, general symptoms favourable.

28th.—The patient is so much better as to be able to return to his home in England.

Commentary.—This patient took diptheria during a time that it was prevalent in Edinburgh; and although his case was rather severe, he made a good recovery. But some days after convalescence had been fairly established his face became swollen, and his urine diminished in quantity. The case is quoted merely as an illustration of inflammatory disease following upon diptheria.

CASE VI.—*Inflammation of kidneys from exposure to cold; persistent albuminuria; inunction of croton oil; recovery.* A. M., married, æt. 36, a shoemaker, born in Ross-shire, resident in Mint Court, Edinburgh, admitted to Ward VII, under my care, on March 22, 1870, complaining of general weakness and kidney disease.

History.—He has been in general healthy. Three years ago he had pneumonia, from which he made a good recovery. He has always been temperate, and had good food. His home is in a tolerably healthy locality. His present illness began on February 1st, when, after exposure to cold, he noticed that his feet were swollen. The swelling soon after extended over the whole body

arms, hands, and face. A week later he suffered severely from pain across the small of the back, and at the same time he observed that his urine was scanty and bloody. Under the care of Dr Brakenridge he improved rapidly, so that in a few weeks he was free from dropsy. But the pain and the morbid state of the urine continued. It was always albuminous, and sometimes bloody. He rapidly lost strength. Family history unimportant.

State on admission.—*Alimentary, circulatory, respiratory, integumentary and nervous systems* normal.

Urinary System.—He complains of a gnawing pain in the lumbar region. The urine is in good quantity, sp. gr. 1012, acid, of dirty reddish brown colour, and deposits a sediment, which was afterwards found to contain blood corpuscles and tube casts.

He was ordered to have 20 minims of syrup of the iodide of iron three times a-day.

30th.—No improvement has taken place. The urine continues as before. With a view to diminish the discharge of albumen and blood, ergotine was injected subcutaneously.

April 1st.—The ergotine has been repeated, but without benefit.

5th.—Still no benefit from the ergotine.

13th.—The urine continuing in the same condition, and the weakness increasing, the patient was ordered to take 10 minims of spirit of turpentine three times a-day.

15th.—The urine smells of sweet violets, but is otherwise unchanged.

20th.—Up to this date various experiments have been made with a view to test the influence of the food upon the urine; but nothing important has been elicited, excepting that the albumen was more abundant after meals. He is to-day ordered to have the lumbar region rubbed with croton oil liniment.

22d.—The urine decidedly less albuminous.

26th.—No further improvement, the urine rather worse than at last report. The liniment has little effect on the back.

May 1st.—Pure croton oil has been applied, and a copious rash has appeared; the albumen is distinctly diminished.

6th.—The urine contains very little albumen. The general health is better.

17th.—Since last report the croton oil has been applied occasionally, the quantity of blood and albumen has varied from time to time, but is on the whole much smaller.

23d.—General health improved, urine clearer, the albumen small in quantity.

June 6th.—The urine contains scarcely a trace of albumen, and the patient feels and looks very much better.

9th.—Albumen scarcely recognisable. General health much improved. The patient is sent to the Convalescent House.

May 1871.—A. M. again presented himself. He has been working regularly since last year, has had no return of the renal symptoms, his urine to-day is natural.

Commentary.—In this case the dropsy rapidly yielded to treatment, but the discharge of albumen and blood continued very persistently. Careful observations in regard to the diet showed that, although the albumen was increased after every meal, the nature of the food taken, whether butcher's meat or otherwise, did not produce any difference. With the view of diminishing the drain of albumen, I directed that ergotine should be injected subcutaneously. This was done on a number of occasions without the slightest benefit. I was led to try this treatment in consequence of the marked usefulness of that drug in cases of hemorrhage. I next tried turpentine, which has in my experience proved very valuable in cases of hemorrhage from the kidney, but it was also useless. It may be worthy of note that the smell of sweet violets, which turpentine communicates to the urine,

was very distinctly present in this case. The next remedy which I tried was croton oil, used as a liniment, one part of croton to three of olive oil, to be rubbed over the small of the back. As this did not produce a free eruption, I tried the pure croton oil. This acted well, and its use was soon followed by diminution of albumen, and in less than three weeks he was dismissed almost quite well. He now enjoys perfect health.

(b) TERMINATING FATALLY.

CASE VII.—*Incipient acute nephritis following erysipelas; death on the second day, complicated with pneumonia, pericarditis, &c.*—Mrs B., æt. 44, was admitted to the Royal Infirmary, under the care of Prof. Bennett, on November 21st, 1865, for eczema. On the 7th of January, when nearly recovered from the eczema, she became affected with erysipelas of the head and face, accompanied by great nervous excitement. On the 12th her urine became albuminous, and she died on the 13th.

Autopsy, twenty-four hours after death.—The scalp was inflamed and thickened, infiltrated with serum. The skull-cap was of natural thickness. The membranes of the brain were congested. There were some serous effusion in the subarachnoid space. The substance of the brain was congested and oedematous. There were slight traces of pericarditis, a little recent lymph coating the right auricle. The lower part of the right lung was in a state of red hepatization. Near the apex there were several masses of old tubercle. The left lung was natural. There were some pale thickened patches on the capsule of Glisson. The substance of the liver was natural. The spleen was natural. There were a few tubercular ulcers in the intestines. The kidneys were of natural size, not congested. Their surfaces were smooth. The cortical substance had a peculiar homogeneous appearance.

On microscopic examination no free exudation was seen in any of the tubules, but the epithelium was in many parts granular and swollen. The malpighian bodies were peculiarly dark, and their epithelium was cloudy and granular. No desquamation of the epithelium at any part could be detected.

Commentary.—The patient evidently died of the results of a blood poison, which affected the lungs, the brain, and the kidneys, and which may probably have resulted from, or perhaps caused, the erysipelas. The case is quoted as presenting an example of a very early stage of the disease, the albumen having appeared in the urine only a few hours before death. I do not think that death was due to the renal complication, nor do I consider it certain that, had the patient been able to withstand the erysipelas and other complications, the kidney disease would have advanced and become serious. Still the case appears worthy of being recorded, as it illustrates the state in which the kidneys unquestionably are at the commencement of the disease.

CASE VIII.—*Acute nephritis, complicated with peritonitis; fatal in an early stage; no dropsy.* H. J., æt. 17, was admitted to the Royal Infirmary under the care of Dr Sanders, December 12th, 1865.

The patient was a prostitute, and had begun to menstruate about ten days before her death. She had some vomiting and purging, which came on suddenly after a severe fright. She was admitted to the Hospital comatose, but quite free from dropsy. She died thirty-six hours after admission. During that time she

passed a small quantity of urine, which contained albumen, and deposited a copious precipitate of granular epithelial tube-casts.

Autopsy.—The body was well nourished; the heart was natural; the lungs were congested, and the bronchi contained fluid. There was general acute peritonitis, the folds of intestine were matted together by recent lymph, and coated with pus. The liver was somewhat pale, the outlines of its lobules were distinct. There was some fatty degeneration of the periphæra of the lobules. The spleen was natural. The mucous membrane of the intestines was natural. There was much congestion about the Fallopian tubes and ovaries, and it appeared probable that the peritonitis had resulted from irritation connected therewith. The kidneys were slightly enlarged, in some parts congested; their cortical substance was of an ash-grey colour. The epithelium in all the tubules was swollen, cloudy, and granular, undergoing a rapid fatty degeneration. Numerous casts were easily scraped from the surface, but the weight of a covering glass sufficed to break them down into a granular debris.

Commentary.—In this case the renal disease may have been secondary to the peritonitis, or perhaps they may both have been results of one morbid poison. The death, at all events, occurred in an early stage of the inflammatory form of Bright's Disease. In this, as in the preceding case, the fatal result may have been favoured by the renal disease, but was unquestionably mainly due to the other maladies.

CASE. IX.—*Acute nephritis consequent upon scarlatina, fatal in the first stage; with dropsy and uræmia.*—J. R., æt. 20, was admitted to the Royal Infirmary, under my care, on February 21st, 1868.

The patient had enjoyed good health until four weeks before

admission, when he had a mild attack of scarlatina. He only kept his bed for a day and a-half, and remained in the house for five days altogether, and then resumed his work. There was very little desquamation. He worked for eight days, when, after exposure to wet, he was again taken ill with sore throat and a general cold. He was then unable to work, and his appetite failed, but he still went about, until he noticed that his feet began to swell.

On admission.—The face was swollen and puffy, but there was little general anasarca. The urine was smoky in colour, of sp. gr. 1012, acid, becoming nearly solid with heat and nitric acid. It contained tube-casts, hyaline, granular, and bloody, with free blood corpuscles. The first sound of the heart was prolonged, and of a blowing character. The precordial dulness was increased. The pulse was 60. The chest was normal anteriorly, there was dulness and feeble respiration behind, particularly towards the base and on the left side. The respirations were 24 in the minute. The tongue was red in the centre, the sides coated with a brown fur. He had considerable thirst and little appetite.

He was ordered to be kept warm, and to take a diuretic mixture. On the 22d he appeared better, and passed a good quantity of urine; but that afternoon he exposed himself to cold—having got up and gone out of the ward.

In the evening he had a convulsion fit which lasted about four minutes. The dulness over the lungs and the embarrassment of respiration increased. He coughed up a large quantity of watery blood-stained mucus. At 3 A.M. of the 23d he had another fit. On the following day he was cupped to 6 oz. over the loins, and dry cupped over the back of the chest. The urine was still in good quantity, but darker in colour. The œdema of the lungs, however, still increased, and he died in the evening.

Autopsy.—There was some degree of general dropsy. The heart was of natural size; contained firm post-mortem clots, and in addition, in both ventricles, particularly the right, there were connected with the valves white granular clots of older date, closely resembling vegetations. The left lung was adherent, the

adhesions œdematous. The substance of both lungs was congested and œdematous. The liver, spleen and gastro-intestinal canal were normal. The kidneys were somewhat enlarged, and considerably congested. The cortical substance was swollen. The tubules contained exudation, and the epithelial cells were granular—in a state of cloudy swelling. They presented, in fact, a good example of the first stage of the disease as before described. The brain was not examined.

Commentary.—This lad presented no unfavourable symptom on admission, excepting the degree of œdema of the lungs. The increase of dropsy, and the fatal termination, were probably due to his exposing himself to cold on the afternoon of the day before his death; certainly we must look to some cause acting on the lungs as well as on the kidneys, for the flow of urine was considerable to the last. I do not know whether the peculiar fibrinous clots which had apparently been formed in the heart before death might have had to do with the fatal termination—possibly they might. It is an interesting fact that two brothers of my patient, who had had scarlatina at about the same time as himself, died with symptoms very similar to those which he exhibited. They were under the care of my friend Dr Bryce.

CASE X.—*Acute nephritis following pneumonia; death.*—Alexander Jackson, aged 60, a labourer, was admitted to the Royal Infirmary under my care, December 19, 1866.

He had been a healthy man until the 13th, when he had a severe shivering, and from that time was unable to work. On

admission he had distinct pleuro-pneumonia of the lower part of the left lung. The pulse was 96, and the urine natural. This attack was going on favourably, though somewhat tardily ; when on the 27th he had another rigor. His feet began to swell, his urine diminished in quantity, deposited copious lithates, and was found to contain much albumen. The quantity of urine continued low. On the 7th January it amounted to 12 ounces, its specific gravity was 1028, it contained much albumen, with blood corpuscles and bloody tube-casts. The dropsy steadily increased. The patient sank, and died on the 9th of January.

Autopsy.—The body was somewhat cedematous, particularly the hands and the lower extremities. The left lung was adherent throughout its whole extent. It was cedematous, and its lower two thirds were hepatized. The right lung was congested and cedematous. The liver, spleen, and gastro-intestinal canal were natural. The kidneys were large and swollen—moderately congested, their capsule stripped off readily. On microscopic examination, the tubules were found opaque, their epithelium in a state of cloudy swelling, presenting a typical example of the first stage of inflammatory Bright's Disease.

Commentary.—This case afforded an excellent example of a condition which I have repeatedly observed,—viz., the supervention of nephritis on pneumonia—a complication which, in a great majority of cases, proves fatal. My prognosis was most unfavourable from the time that the albuminuria appeared.

*Cases illustrative of the Second Stage.**(a) TERMINATING FATALLY.*

CASE XI.—*Acute nephritis, passing into the second stage; general dropsy; effusion of fluid into the pleuræ; disease of the lungs; and death.* E. H., æt. 13, born in Fisherrow and resident there, was admitted to Ward VII, under my care, February 6th, 1871, complaining of general debility and anasarca. She had been ill three months.

History.—The patient has had small-pox, measles and typhus, and since the last named, which occurred in her tenth year, has been delicate. Has always had good food and lived in a healthy neighbourhood; but was much exposed to draughts and cold in the pursuit of her occupation of selling newspapers at Musselburgh Railway Station. Three months ago she caught cold; it was followed by rigors, headache, pain in the loins, and swelling of the hands, feet, and ultimately the body generally. This compelled her to give up work. By the advice of her usual medical attendant she took various remedies, but without benefit.

On admission.—She was very dropsical. There was no derangement of the gastro-intestinal functions, but some degree of ascites. The heart was natural. The pulse 95. She had some cough, and the respiratory sounds were rather harsh, but respiration was otherwise natural.

Integumentary System.—There is great œdema of whole body.

Urinary System.—There is no pain in the lumbar region. The urine is scanty and very high coloured; sp. gr. 1030; reaction faintly acid, and a deposit is thrown down containing crystals of triple phosphate, with granular and epithelial casts, and blood corpuscles. Urine highly albuminous. She was ordered forty grains of compound powder of jalap, also—

R. Spt. ether. nitrosi, ℥vi.

Inf. digitalis, ℥vi.

Misce.

Sig.—Half an ounce to be taken three times a-day.

Hot fomentations to be applied constantly to the back.

8th.—The aperient acted freely. She was ordered Tincture of Perchloride of Iron, in addition to the other medicine.

10th.—The urine amounted to 20 oz. The general symptoms are not improved.

14th.—Urine 42 oz. ; it is still loaded with blood.

16th.—Urine being again diminished, she was ordered to have a liniment of croton oil, one part of croton to three of olive, rubbed into the lumbar region.

18th.—The urine is darker in colour, smoky brown. Sp. gr. 1030. Quantity 30 oz. Albumen and blood copious.

21st.—The œdema of face has increased. Quantity of urine 24 oz. Character not improved.

26th.—Urine 40 oz.

27th.—The œdema has diminished in past few days ; and the face is almost natural. There is no pain or uneasiness in any part of the body. Urine 24 oz., slightly tinged with blood. She sleeps well. Her bowels are open ; appetite good. Her skin acts freely.

28th.—Much better. Urine 22 oz. Improved in colour. Albumen considerable.

20th.—Urine 34 oz., slightly tinged with blood ; reaction neutral ; loaded with albumen. She sleeps well ; bowels open ; appetite good ; skin active.

March 2d.—The patient is much the same as at last report. Urine 36 oz., colour tinged with blood.

4th.—Urine 30 oz. For the last week it has been gradually increasing in quantity and improving in colour ; but to-day the quantity is diminished and the colour is a very dull red with a copious sediment ; sp. gr. 1020 ; very feebly acid, loaded with albumen. Under the microscope numerous casts are to be seen, granular and fatty, with blood corpuscles.

6th.—Much the same for the last day or two. Urine 36 oz., tinged with blood.

7th.—For the third time since her admission her face has become generally œdematous after attaining its natural size. The colour of the urine improves as the œdema diminishes, but to-day

it is of a dark blood colour, with a copious sediment. Sp. gr. 1023. Reaction, acid; albumen considerable. She sleeps well; has been very thirsty for some days; bowels open; tongue furred down centre. Up till to-day the tongue has remained clean. Ordered cream of tartar electuary.

8th.—The electuary has acted freely on the bowels. There have been several watery evacuations. Œdema still is great. Appetite not so good. Thirst diminished. Complains that she is more uneasy and hotter in the evenings than she used to be. The pulse is 95. Tongue a little cleaner. Urine 24 ounces, of a dark blood colour. Her feet are considerably swollen, her hands slightly so.

10th.—Œdema is lessening. Much better. Face rather flushed. Urine of a dark blood colour.

13th.—Urine 34 ounces. Although her face and hands are now almost natural, her back yesterday became swollen. Cannot lie on her back because of pain. She continues to take the cream of tartar. Her appetite is failing rapidly.

14th.—She cannot lie on her back because it is painful and swollen. Has not slept well for two or three days. For the last day or two she has occasionally had difficulty in breathing. Not swollen about face, but considerably flushed. Bowels are well opened. Urine 40 oz.

15th.—For the last week has had a cough, which became very troublesome last night. Was ordered mustard poultice to throat. Pain in back was more severe—ordered turpentine stupes. Urine 30 ounces. Owing to her bowels being so freely open her urine has not been examined for several days. Her face is much paler in colour. She is nervous, and suffers from dyspnoea.

16th.—No improvement.

17th.—Her cough has become much more distressing, and she has slight expectoration, and pain across the chest. The pain in the back is much more severe. Poultices are still applied for the former, and turpentine stupes for the latter. Bowels are still freely open. Sleeps ill. Appetite is very bad; for the last few

days she has scarcely taken any food. The face is pale, and has an anxious expression. She is slightly feverish. Had accelerated and oppressed breathing. The skin has acted freely all along. She has never complained of any pain till within the last few days. Yesterday and to-day has had several attacks of epistaxis. Has no impairment of vision. Urine 30 oz.; very bloody and highly albuminous.

She died quietly about 6.30 P.M.

Post mortem examination from the report by Dr Wyllie.—There was general anasarca, but not to an excessive degree. Body pale, and abdomen distended, the peritoneal cavity containing a considerable amount of clear yellow serum.

Kidneys.—Each weighed 6 oz. Engorged and white in appearance, soft and pliant to the feel. The capsules striped off easily, leaving a smooth pale surface. On section, the surfaces were of a greyish white colour, and opaque. The cortical portion was increased in bulk. The pyramids were dark and congested, as contrasted with the white cortical substance. Under the microscope the tubules are found filled with fatty granules, many of them appearing, by transmitted light, as solid opaque cylinders. In others the epithelium was still present, and was loaded with fatty granules.

Liver weighed $2\frac{3}{4}$ lbs.—somewhat fatty, otherwise healthy.

Spleen weighed 2 oz.—very pulpy.

Thorax.—In the pericardium there were two ounces of straw-coloured serum.

Heart.—The heart weighed 7 ounces. Right side soft and flaccid, moderately dilated, with, as afterwards seen, a dark clot of blood. Pulmonary and tricuspid valves normal. Left side of heart apparently normal. Aortic and mitral valves natural. In the wall of the aorta, just above the aortic valves, there are minute patches of atheromatous thickening about the size of mustard seeds, one above each valve.

Lungs.—Each pleural sac contained about 2 quarts of clear serum. Lungs considerably reduced in bulk. In the superior lobe of right lung, close above its root, there is an elongated patch

of condensed lung tissue, a portion of which sinks in water. The patch measures 1 inch long, and $\frac{1}{2}$ inch broad, and is of a motley dark and reddish brown colour. Under the microscope the cells of this patch are found occupied by a large number of lymph corpuscles, mingled with a few compound granule cells. Under the surfaces of the pleuræ were a number of small thinish red circumscribed patches, many of them depressed below the level of the pleuræ; portions of them sink in water.

Right lung.—In the superior lobe there are two large solid masses, one situated about 2 inches below the apex. On the anterior edge, close to the pleural surface, there is a patch about the size of an apple. The pleural surface is of a greyish colour, and on section it presents a dull black tint with grey surface. The inferior solid mass is of a prismatic shape, occupying the lung tissue along the margin of the interlobular fissure for a distance of 3 inches, and measuring $\frac{1}{2}$ inch across. The section presents a dirty yellowish grey appearance. On the lower lobe of the lung there is a solid mass of precisely similar characters to that described, and occupying the angle of the lung at the interlobular fissure. Measures $2\frac{1}{2}$ inches in length, and 2 inches across. Over these various solidifications the pleural surface presents some shreds of lymph, and at one or two points it is whitened and thickened.

Commentary.—I was unfortunately absent from the Infirmary during a great part of this patient's illness, but the treatment was satisfactorily conducted by my resident physician Dr Alexander Bennett. The patient had been originally of a somewhat weak constitution—her growth had been retarded—she was a small, delicate girl. The illness originated in exposure to cold, and its whole duration was between four and five months. On admission my diagnosis was inflammatory Bright's Disease in the second stage, and the prog-

nosis was rendered rather unfavourable by her general want of tone, and the tendency to frequent exacerbations which she manifested. She had mild hydrogogue cathartics, and non-stimulating diuretics from the first, and some time later croton oil liniment was applied over the back. This treatment was begun soon after the commencement of one of her exacerbations, but as it caused her much annoyance was not continued. It appeared to produce no beneficial effect. The fatal result was due to dropsical effusion into the pleuræ, and other serous cavities, and to the affection of the lungs. Of the nature of the pulmonary lesion I was unable to satisfy myself, not having seen it. The kidneys were preserved for my examination, and presented very distinctly the characters described as those of the second stage of inflammatory Bright's Disease.

CASE XII.—*Acute nephritis, following upon exposure to cold; dropsy, fatal in second stage.*—B. M., a servant, æt. 17, unmarried, was admitted to the Royal Infirmary, under the care of Professors Laycock and Bennett, January 20th, 1860.

Previous history.—Had always been healthy until fifteen months before admission, when, after having had her feet wet, she observed them to be swollen. The swelling gradually subsided, but she felt ill, being subject to occasional palpitation, increased by exertion. On January 6th, a fortnight before admission, her stockings got very wet, but she continued to wear them during the rest of the day. Next morning her face and legs were swollen, and she felt considerable palpitation. As these symptoms did not diminish, she sought admission to the Royal Infirmary.

On admission.—The face and legs were œdematous, and she appeared anæmic. The heart sounds were natural. There was some embarrassment of respiration, and sibilant and sonorous rales were heard over the chest. There was some dulness towards the base of the lungs. The digestive and nervous systems were normal. There was considerable tenderness on pressure over the region of the kidneys. The urine was small in quantity, muddy, and deposited a precipitate composed of blood corpuscles and tube-casts, some bloody and some granular. It was highly albuminous. Diuretics, dry and wet cupping over the kidneys, and various other plans were tried without material benefit. The dropsy gradually increased, also the embarrassment of breathing, although the amount of urine increased, and the blood disappeared from it. Casts with fatty epithelium replaced the granular and bloody casts formerly so abundant, and among them not a few hyaline ones were found. Sloughing sores formed on her legs, and she died with symptoms of pyæmia on April 14th.

Autopsy.—Only the kidneys were examined. They were enlarged; the surface was smooth, mottled with yellow, fatty, sebaceous-looking matter; the capsule easily peeled off. On section the cortical substance was found enlarged, dense, opaque, and fatty; and on microscopic examination the tubules of the cortex and some of those of the cones were found distended with exudation and fatty matter. There was no change in the vessels or stroma.

Commentary.—This case lasted for three months and a week, and the second stage of the renal affection had been reached. There was not a trace of atrophy. Almost the whole of the cortical substance of the kidneys was shut off from functional activity, and, unless some means had been successful in removing the exuded material, recovery was impossible.

CASE XIII.—*Nephritis, fatal in second stage.*—E. C., æt. 48, a washerwoman, was admitted to the Royal Infirmary, under the care of Dr Bennett, March 14th, 1860.

History.—She had always been healthy until October 1859, when she got her feet wet during a menstrual period. She then felt cold and shivering, but continued to work during the day; at night she had distinct rigors, and she observed that the quantity of her urine diminished, and that it was of a dark colour. She continued to work with the aid of stimulants for three weeks, but at the end of that time the dropsy of her feet and ankles compelled her to take rest. The swelling steadily increased. In the beginning of February she felt some difficulty of breathing, and complained of a cough. All these symptoms becoming worse, she sought admission to the Infirmary.

On admission.—There was general anasarca; the abdomen was much distended, measuring 44 inches in circumference. There was no pain on pressure over the kidneys. The urine was in small quantity, smoky, of sp. gr. 1010, very albuminous, and threw down a thick whitish sediment, composed of granular and fatty tube-casts, with some blood corpuscles. The tongue was furred, the appetite bad, the bowels constipated. There was much dyspnoea, considerable consolidation of the left lung posteriorly. The cough was frequent, and accompanied by a tenacious purulent expectoration. The heart was natural.

After admission.—Under powerful diuretics the quantity of urine rose, but again gradually subsided, notwithstanding the continuance of the drugs. Bitartrate of potash seemed to be the most useful, but appeared to increase the quantity of blood discharged by the kidneys. The dropsy never materially diminished, and the dyspnoea was constantly increasing. She died exhausted, on April 7th.

Autopsy.—There was general anasarca, and much ascites. There were also effusion into the pleuræ, and a considerable amount of mucus in the bronchi. The heart was natural. The liver was congested, and weighed 3 pounds. The spleen was

small and dense; it weighed 2 ounces. The intestines were healthy. The kidneys were enlarged, pale, and mottled; they weighed together $15\frac{1}{2}$ ounces. The capsule was easily stripped off. The cortical substance was swollen, opaque, and fatty. The tubules were found, on microscopic examination, distended with exudation; the epithelium was to a great extent fatty.

Commentary.—This was a less acute case than the last. It proved fatal in the second stage, having lasted for six months.

CASE XIV.—*Nephritis, following upon cold, fatal in second stage; uræmia; dropsy; apoplexy.*—J. P., æt. 40, was admitted to the Infirmary, under the care of Dr Laycock, February 15th, 1865. She was a married woman, of temperate habits. About the middle of November 1864 she was exposed to cold and wet. She then became affected with lumbar pain, swelling of the face, afterwards of the legs, and at last of the whole body. The urine was high coloured, and diminished in quantity.

On admission.—She had symptoms of bronchitis. The whole body was œdematous. Her urine contained much albumen, and a large number of granular tube-casts. She did not improve under treatment, but gradually became worse until the middle of April, when she was seized with convulsions, afterwards became comatose, and died April 16th.

Autopsy.—The body was very œdematous. The peritoneum was distended, and there was a considerable amount of fluid in the pleuræ and pericardium. The heart was natural. The lungs were congested and œdematous. The liver was small, congested, and fatty. The spleen was natural. The kidneys were enlarged, and presented the characters of a typical example of the large fatty kidney, the second stage of the inflammatory form of Bright's Disease. There were some serous effusion into the subarachnoid space, and in the optic thalami there were recent clots.

Commentary.—This case was an example of the inflammatory form, terminating during the second stage, five months after the commencement of the malady. The death did not result directly from the renal disease, but from the apoplexy.

CASE XV.—*Inflammation of kidneys in second stage, complicated with diabetes, fo. death from erysipelas and sloughing of thighs.*—A. L., æt. 30, married, native of and residing in Falkland, was admitted to Ward VII, under my care, on April 29th, 1871, complaining of dropsy, from which she had suffered for six months. The following account is an abstract of the report of the case by Mr Kennedy Douglas, clinical clerk.

History.—For some years past the patient had suffered from symptoms of ulcer of the stomach, but during the past eight months has been free from them. Her habits are temperate, and general surroundings favourable. Six months ago she had a miscarriage, and when she was recovering from this, caught cold, and swelling of the feet, hands, and abdomen gradually came on. The dropsy steadily increased, and was so great that the skin of both legs gave way, and a large quantity of fluid drained off. It continued to drain away at the time of her admission.

On admission.—She appeared emaciated in the face, but the hands, legs, thighs, and abdomen were dropsical. Her temperature was 100·4.

Alimentary system.—Lips, teeth, and gums natural; tongue furred; there is a bad taste in the mouth, and great thirst; appetite good, but not excessive; there is much flatulence, and considerable ascites; the liver is of natural size.

Circulatory and respiratory systems normal.

Integumentary system.—Skin very dry; arms, loins, and legs dropsical. The skin of the legs is excoriated, in consequence of irritation by dropsical fluid.

Urinary system.—Some pain in lumbar region, urine about 40 ounces, straw coloured, slightly opaque; sp. gr. 1032; of acid reaction, contains albumen and sugar.

There is nothing else wrong, excepting that she has not menstruated since the miscarriage six months ago. She was ordered 20 grains of acetate of potash three times a-day, also half an ounce of infusion of digitalis, and to have the excoriated portions of the legs dressed antiseptically.

May 12th.—The ordinary tests failed to detect albumen, and it continued absent till the 15th; the quantity rose steadily, from 40 ounces on the 1st, to 250 on the 14th.

15th.—The urine amounts to 160 ounces. In the evening she became more seriously ill—the pulse 120, temperature 101·6. A diffused erysipelatous blush has appeared on the outer side of the left thigh just above the knee, and on the right leg below the knee.

17th.—About the middle of the erysipelatous eruption numerous vesicles were formed.

21st.—A slough appeared on the outside of the left and on the middle of the right thigh—the sloughing and erysipelas went on increasing until May 24th, when she died.

Autopsy thirteen hours after death.—Body emaciated, but in some parts dropsical; the skin of the left leg and thigh extensively sloughed; bed sores over the sacrum.

Thorax.—The pericardial sac contained about 2 ounces of fluid, with flocculent masses of lymph floating in it. The visceral layer of the pericardium was of a milky hue. The heart weighed 10 ounces; it was natural, excepting that there were some minute extravasations of blood beneath the endocardium. The bronchial tubes contained a quantity of frothy mucus. The substance of the lungs was œdematous.

Abdomen.—There were some old fibrous adhesions connecting the stomach to the anterior abdominal wall, and the liver to the diaphragm. The liver weighed 3 lbs. 10 ozs. Its structure generally appeared natural; but scattered throughout its substance there were numerous masses, varying in size from a pea to a wall-nut; the smaller masses of a yellowish colour—the larger contain-

ing extravasated blood, mingled with their structure. One large yellow mass of the size of a walnut projected from the surface, and was distinctly umbilicated. On microscopic examination these masses were found to be composed of aggregations of flask-shaped glands, lined with columnar epithelium, and in the case of some, mingled with and partially destroyed by blood. The *spleen* was normal. The *pancreas* contained several masses similar in appearance to, and identical in structure with, those in the liver. The *kidneys* weighed 6 ounces each. The capsules stripped off readily. On section the cortical substance was seen to be relatively increased, and to contain sebaceous-like or fatty matter in many of its tubules. On microscopic examination the affected tubules were found to contain granular matter with fatty and degenerated epithelium.

Commentary.—In this patient there was a very singular combination of maladies—albuminuria co-existing with diabetes. We could obtain no information as to the date of origin of the latter. Both were present on her admission to the Hospital. The symptoms of inflammatory Bright's Disease had come on about seven months before her death, in consequence of exposure to cold while recovering from a miscarriage. The anasarca had been such that the skin of the legs had given way. The dropsy had thereby been relieved—but the excoriation caused by the constant dribbling of the water produced great irritation and exhaustion. It is worthy of remark that the albumen was at times almost absent from the urine, and on some days could not be detected; but it reappeared before her case took the unfavourable turn which ushered in the fatal erysipelas and sloughing.

It seems that the cutaneous affections which are known to occur in diabetes have a special tendency to appear when albuminuria is superadded. The constitutional disturbance was manifest before the local lesion, and I have scarcely seen erysipelas of such a malignant type. The influence of the renal disease in diminishing the polyuria attendant upon diabetes was well marked, as was also the facility with which the diuresis was established under treatment. The renal affection was distinctly improved under treatment. We had no opportunity of examining the brain. The second stage of inflammatory Bright's Disease was well marked in the kidneys. The mass of the liver presented a peculiar fine-grained appearance, which I have often observed in the livers of diabetic patients. The nodules which existed in the organ and in the pancreas presented an example of an interesting new formation which I have met with but rarely—only once before in the liver, and once or twice in the stomach. Its general appearance is undistinguishable from cancer, but careful microscopical examination shows that it is formed of gland tissue, as described in the report. I venture no opinion as to a connection between this and the diabetes, and only mention that there was no such history in the other cases which I have examined *post mortem*.

(b). TERMINATING IN PARTIAL OR COMPLETE RECOVERY.

CASE XVI.—G. F., æt. 32, a shopman, native of Newcastle, resident in Pleasance, Edinburgh, was admitted to Ward VII., under my care, November 8th, 1869, complaining of dropsy and uneasiness of chest.

History.—The patient has always been a temperate man, and enjoyed good health until May last, when he had influenza. A few days later he was taken severely ill—had rigors, and ten days afterwards he had a rash, which was followed by desquamation. This was succeeded by what his medical attendant called inflammation of the kidneys. His urine was diminished in quantity; his feet, hands, and afterwards the body and face, swelled. He returned to work before he was well, and has been working off and on since; has considerable dropsy, sometimes more severe than at others.

On admission.—His complexion is pasty, his general appearance dropsical.

Alimentary and circulatory systems.—Normal.

Integumentary system.—The skin is somewhat dry; there is no eruption. The legs, thighs, loins, and face are cedematous.

Urinary system.—There is no pain. He passes water five or six times in twenty-four hours. The quantity yesterday was 25 ounces, to-day 33 ounces, is of a pale straw colour, somewhat opaque, sp. gr. 1022, reaction slightly acid. Albumen copious. Numerous hyaline and fatty tube-casts are deposited when the urine stands.

Ordered R. Tinct. Ferr. Perchlor ꝑii.

Spir. eth. nit. ꝑiv.

Inf. quass. ad ꝑvi.

Misce.

Sig.—A table spoonful three times a-day.

Also, R. Elect. potass. bitartatis ꝑii.

Sig.—A teaspoonful three times a-day

29th.—Under this treatment the patient has steadily improved;

the urine has increased, the amount of albumen diminished, and the dropsy disappeared. To-day the urine is 40 ounces, of sp. gr. 1021, and contains little albumen.

Dec. 3d.—The urine is 42 ounces, contains a few hyaline and granular casts, and is still albuminous.

Dec. 8th.—He was ordered 10 grs. of gallic acid twice a-day, in the hope of diminishing the drain of albumen.

Dec. 15th.—The albumen has not diminished, and the dropsy has slightly recurred. He is ordered a drachm of the syrup of the phosphate of quinine, iron, and strychnine, three times a-day.

17th.—Croton oil liniment to be applied over the loins, as the albumen has been more copious.

29th.—The general health is much improved. He is quite free from dropsy, the urine, in fair quantity, contains considerably less albumen than it did before the croton oil was applied. He is to-day dismissed much improved.

Commentary.—This patient has now suffered from inflammatory Bright's Disease for upwards of two years. It appears to have originated in an attack of scarlatina. The symptoms have never been very acute, or such as to cause special anxiety; but the disease has been very persistent. The attempt to reduce the albumen by means of gallic acid failed entirely. But certainly some degree of benefit followed the inunction of croton oil. For the past year he has been able regularly to attend to his occupation; although suffering frequently from dropsy, and always from albuminuria.

CASE XVII.—T. L., æt. 62, unmarried, a carter, born in Leith, and resident there, was admitted to Ward VII, under my care, on

March 22d, 1870, complaining of dropsy and diminished secretion of urine.

History.—He has always enjoyed good health, although he owns to being a heavy drinker. About three weeks ago, after working hard in rain and snow, he noticed that his legs and feet began to swell, and that he had a pain in the renal region. He remarked no change in the urine, and continued at his work while the dropsy steadily increased.

Family history.—Unimportant.

On admission.—The *alimentary system* is little affected; the *circulatory* and *respiratory systems* are normal.

Integumentary system.—The lower half of the body is very oedematous.

Urinary system.—There is occasional pain in the region of the kidneys; he passes about 30 ounces of urine per day; it is of a smoky colour, acid, of sp. gr. 1015, contains a large amount of albumen, and throws down a deposit in which blood corpuscles, but no tube-casts, are found.

Nervous system.—Normal.

He was ordered :—

R. Tincturæ scillæ ℥ii.

Tincturæ digitalis ℥iii.

Tincturæ ferri perchloridi ℥ii.

Decoctum scoparii ad ℥vi.

Misce.

Sig.—A table spoonful three times a-day.

31st.—The patient is in much the same state as formerly. The abdomen measures 46 inches at the umbilicus. The urine has lately varied from 20 to 30 ounces daily. He is ordered a drachm of electuary of cream of tartar three times a-day.

April 18th.—Abdomen now measures 36 inches. Legs oedematous. Urine 35 ounces. He is ordered, in addition, 6 ounces of gin. The quantity of albumen is one-sixth or one-seventh.

27th.—The digitalis is discontinued, as it depressed the heart's action, and instead of it the following mixture is prescribed :—

R Spiritus etheris nitrosi ℥vi.
 Spiritus ammoniæ aromatici ℥iv.
 Tincturæ scillæ ℥iv.
 Aquam, ad ℥vi.

Misce.

Sig.—A table spoonful three times a-day.

May 6th.—The patient is able to sit up for a couple of hours.

23d.—On account of periodic neuralgic headache, he is ordered 2 grains of quinine three times a-day.

June 8th.—Considerable improvement has taken place. The abdomen measures $32\frac{1}{2}$ inches. The dropsy otherwise has quite disappeared, excepting slightly on the feet at night, when he has been long out of bed.

18th.—He is much better. The albumen is still copious. He is to have croton oil rubbed over the renal region.

21st.—Patient much improved. The urine yesterday 45 ounces; contains less albumen. To-day the patient is dismissed, as he considers himself fit for work.

Commentary.—In this case—which resulted from exposure to cold, and occurred in an old man—an excellent result followed the use of diuretics. The croton oil did not get a fair trial, but after its application the albumen was certainly diminished.

CASE XVIII.—*Acute nephritis; partial recovery during the second stage.*—R. P., æt. 26, a maltster, had been healthy until January 1865. He had been originally a baker by trade, but had four years ago become a maltster; in both businesses he was much exposed to vicissitudes of heat and cold.

About the end of January 1865 he noticed his feet swelling. The œdema increased rather rapidly. He had frequent calls to micturition, but he made little water at a time, and that dark and bloody. He was admitted to the Infirmary on March 3d, suffering from severe dropsy and uraemic convulsions. Under treatment

by means of cupping over the kidneys and diuretics the urine increased in quantity, and he somewhat improved; but the dropsy again increased, and the urine diminished. When he came under my observation, on April 27th, the following was his condition:—The face was pale and pasty. There was great dropsy of the legs and feet, scrotum, penis, and flanks, and considerable ascites. The urine, which amounted to forty ounces, was pale, but smoky, of sp. gr. 1020, highly albuminous, and deposited a precipitate containing numerous casts, hyaline and fatty. There was a good deal of bronchitis. Hot-air baths and acetate of potash had been tried for some time. He was ordered, April 28, a dessert-spoonful of infusion of digitalis three times a-day, and on the following day a drachm of electuary of bitartrate of potash was added. These did not induce diuresis, indeed the urine rather diminished in amount, and the dropsy increased. On May 3d he was ordered to inhale forty minims of oil of juniper twice a-day. The quantity of urine at once increased, and the dropsy began to diminish. The quantity of water steadily increased, rising from forty-six ounces on May 1st, to eighty-four on the 12th, and afterwards to more than one hundred ounces. On May 11th, a few pricks were made with a needle in the left leg to relieve the obstinate dropsy, and a considerable amount of water drained away. On the 24th of May the dropsy had disappeared.

From this time he pretty steadily improved. The dropsy was quite gone. The urine was in good quantity, with a natural amount of urea and salts, and the albumen diminished. The fatty were replaced by hyaline casts. He was dismissed on August 8th, quite well, excepting that his urine was albuminous.

In October of the same year he was exposed to cold and damp in his situation as light porter, and in consequence had a reaccession of his disease. The quantity of urine was reduced to twenty ounces. It was very albuminous, with tube-casts containing fatty cells. The dropsy was very considerable; and he had one uraemic convulsion. Under diuretics he again steadily improved, and was dismissed on December 15th. The albumen continued at date of dismissal.

A few months later he came to the hospital, said he was quite well, and regularly at work, but his urine still contained some albumen.

The patient was again admitted on March 6, 1871, when the following report was taken by Mr Nesbit, Clinical Clerk :—He was last in the Infirmary on account of a surgical ailment two years ago, and since that time has had no swelling excepting after he had been at work for some hours. He had no cough, and felt altogether pretty well until a fortnight ago. During the whole interval he had never suffered from gastric symptoms, nor had he any fits. His urine averaged from 50 to 60 ounces daily, and he has had to rise twice every night to micturate. For the past six weeks, however, he has noticed that the quantity has increased, and he has risen three or four times nightly. A fortnight ago a cough commenced, and at the same time his legs swelled more than usually. He also noticed about this time pain in the loins, which was increased by stooping or rising from the sitting posture.

On admission his temperature was 99°.

Alimentary system.—Tongue pale, flabby, and slightly furred. He has always a bad taste in his mouth. Appetite good; thirst constant. Has a feeling of weight after meals, with flatulence. Bowels regular. Hepatic dulness natural.

Circulatory system.—Form and appearance of the præcordia natural. Impulse, between the sixth and seventh ribs, feeble. Superficial cardiac dulness, $2\frac{1}{4}$ inches transversely. On auscultation at the apex, the first sound is heard prolonged, the second accentuated. At the aortic and pulmonary cartilages the first sound is scarcely audible, the second very much accentuated. Pulse, 64, full. Arteries thickened.

Respiratory system.—Form and action of chest natural. Vocal fremitus rather greater on right side. There is slight dulness under both clavicles; on both sides expiration is prolonged; breathing harsh; sibilus with inspiration, and occasionally with expiration; vocal resonance natural. Posteriorly the condition is the same, except that the vocal resonance is rather increased at the left apex. The breathing is short. Cough is troublesome when he is taking exercise. Sputum mucopurulent.

Integumentary system.—The face is somewhat puffy ; the legs cedematous, especially the left.

Urinary system.—Lumbar pain is severe, worse after exercise and at night. He has some vesical pain when the organ is distended. Urine is 90 ounces, neutral, pale straw-coloured, frothy. It becomes solid to about half its volume on application of heat and nitric acid. There were some hyaline and granular tube-casts, but not in large number.

Nervous system.—Sight good ; no fits ; occasionally suffers from headache.

He was ordered—

R. Spir. eth. sulph. min. xv.
Spir. chloroform. min. xv.
Decoct. senegæ ad ℥iv.

Misce.

Sig.—To be taken three times a-day.

He was also ordered 20 minims of syrup of quinine, iron, and strychnia, three times a-day.

The patient remained in the Infirmary until the end of April, during which time the cough ceased and the œdema disappeared from the feet. The severe pain in the renal region yielded apparently to quinine, which he took in 5-grain doses three times a-day for some time. With the hope of diminishing the albumen in the urine, the lumbar region was repeatedly rubbed with croton oil, but without benefit.

The patient again presented himself at the Infirmary on June 3, 1871, complaining of pain in the side and a bad cough. The following account of his state is from the report by Mr Shaw, Clinical Clerk :—

History.—Since leaving the Infirmary, six weeks ago, has been working as a labourer at St Margaret's Railway Works, and continued in fair health till the 18th of May, when he was affected with severe headache, which lasted till the 21st. On the 22d he went to work, but that night he began to cough. The cough continued to trouble him for five days, but did not cause him to leave off his work. Early on the 27th he had a rigor. Some

hours later a mustard poultice was applied, pain having begun on the sides, especially the left. In the afternoon another rigor occurred. The pain on breathing, dyspnœa, and coughing continued to get worse until the 29th. As he did not improve, he sought admission to the Royal Infirmary. His urine was not decreased in quantity, nor affected in any way.

On admission.—He is a well made man, of bilious temperament, dark and pasty complexion. Prefers to sit up.

Alimentary system.—Natural, excepting that the appetite is bad and thirst considerable.

Circulatory system.—As during his last residence in the Infirmary.

Respiratory system.—The chest is tolerably well formed, action fair, freer on right than left side. Vocal fremitus natural. On percussion there is slight dulness at the base of the right lung anteriorly, as also, though to a less extent, in the left. Elsewhere the lungs are rather hyper-resonant than otherwise. On auscultation the two lungs present similar physical signs; the respiration is prolonged, the character marked by rales sibilant above and below, sonorous in the middle. At the bases posteriorly fine crepitation is audible. Over the anterior and lateral portions of the right lung, from about the third rib to the base, friction is heard, as is the case also on the left side over a smaller area. The vocal resonance is not increased. Breathing painful and laboured, 22 per minute. Sputum rather copious, greenish, mucopurulent.

Integumentary system.—There is no œdema.

Urinary system.—There is no lumbar pain. His urine is passed nearly every hour during the day, and four times at night. The quantity passed each time is only two to three ounces; but there is great vesical pain and uneasiness if the act be not thus frequently performed. The urine is scanty. Sp. gr. 1011, of acid reaction. It throws down a slight flocculent deposit containing epithelium and tube-casts in great numbers. Some are hyaline, others granular, and others fatty. Many combine in different parts these various characters. Albumen is in large quantity. There is no sugar.

Reproductive system.—Normal.

Nervous system.—Normal, excepting for the pain and sleeplessness attendant on his trouble.

Locomotary system.—Bones and joints normal. The muscles are flabby, and much softer than formerly.

June 5th.—The sides painted over with liniment of iodine, and a mixture containing 5 minims of ipecacuan wine, 10 of spirit of chloroform, 40 of syrup of squills, and half an ounce of infusion of senega, four times a-day. The urine is 28 ounces. Sp. gr. 1011; but he has had some diarrhœa. Was ordered some lead and opium pills to check the diarrhœa.

June 7th.—He became worse in the afternoon; vomiting, hiccup, great abdominal tenderness; some twitching of the facial and other muscles, with delirium and somnolence; temperature 99; pulse 90. Was ordered bismuth, soda, and rhubarb.

June 8th.—Considerably better, except in respect of vomiting,—to have ice, potash water; to take only eggs, and in small quantity at a time.

June 9th.—Better, friction less distinct, rales still audible; urine 18 oz.; sp. gr. 1011.

June 12th.—General symptoms are improved; urine 46 oz.; sp. gr. 1009. Diarrhœa has abated.

June 14th.—Urine 44 oz.; sp. gr. 1011; pulse 64.

June 15th.—Urine 54 oz.; sp. gr. 1010; pulse 52.

From that time till June 30th he gradually improved, the physical signs and the symptoms disappearing from the chest. Urine, though still albuminous, ranging from 60 to 80 oz. daily,—its specific gravity from 1010 to 1013.

Commentary.—The case was a typical one of acute nephritis, passing through the second stage of fatty degeneration, and becoming chronic. The value of diuretics was very apparent, and particularly of the oil of juniper, as first recommended by Sir James Y. Simpson. A distinct increase of the flow of urine fol-

lowed its administration, and from my experience of it in this and other cases, it seems to me a remedy which should be tried in all obstinate cases of dropsy. During the past three years important changes have occurred in this patient. The heart sounds have become changed, the first sound prolonged, and the apex beat is marked between the 6th and 7th rib; the area of dulness of the heart is also enlarged, so that we may be satisfied that hypertrophy has taken place. There is nothing to account for this change excepting the renal disease. The radial arteries are thickened, not calcareous, but certainly sclerosed or atheromatous. This change also appears due to the renal malady. The complexion is pale and pasty; and even in his best times, now, his general appearance is much inferior to what it was a few years ago. Dropsy now troubles him very little; and even during his recent attack of pleurisy, with bronchitis, it was never considerable. He has had several acute intercurrent attacks, one of pleurisy, two of bronchitis, and several of gastric catarrh, with vomiting and great depression. He has been able to work regularly, with only two or three interruptions, on account of the attacks above referred to; but the increasing frequency of these attacks, with the changes in the heart arteries and system generally, render me now apprehensive of a fatal result. The quantity of urine is now generally rather above the natural, and he is often called to rise at night, although the quantity passed at each time is small.

Cases illustrative of the Third Stage.

CASE XIX.—Daniel Campbell, single, æt. 27, brass-finisher, born in Edinburgh, residing in Dublin, was admitted to the Royal Infirmary, under my care, on the 13th March 1871, complaining of dimness of sight, pain in the head, especially on the right side; of disordered digestion and vomiting, and of dyspnœa on making any unusual exertion.

History.—Patient states that he was always strong and healthy until five years ago, when he had a febrile attack, with great difficulty in passing his urine, which was scanty and high-coloured, and followed in a few days by general dropsy, commencing in the eyelids, face, and lower extremities. There was no pain in the lumbar regions, and he believes the illness to have been caused by exposure to cold after being present in a hot crowded meeting. He was treated in the Royal Infirmary, and left in a few weeks quite free from dropsy; but from this time he has always been weak and debilitated, his feet frequently swelling at night. About eighteen months ago he passed blood in the urine during a fortnight, but did not notice any difference in the quantity secreted, although he passed it very frequently; but ever since the attack of dropsy he has had to get up at night to micturate; and at times, when he felt the desire to make water, he had to strain before he could pass any. Lately the desire has become more frequent. The present illness commenced about six months ago with pains in the head, for which he was treated in Dublin with mercury pills, and blisters behind the ears and at the back of the neck, which afforded relief; and he was then ordered quinine and good free diet; but he again became worse, and two months ago he noticed his eyesight becoming dim. He came to Edinburgh, and was admitted to the Eye Wards on 10th March, from which, albuminuric retinitis having been discovered, he was transferred to my wards. His habits as to food and drink have been generally good, especially lately, for he has found the pain in the head to be

always aggravated by the use of stimulants. He never had syphilis. His family history is good.

On admission.—He was a man of average height, of lymphatic temperament, not emaciated, but pale and of pasty complexion.

Alimentary system.—The mucous membrane of the lips, gums, and cavity of the mouth is anæmic; the tongue is large and flabby, and coated with a light yellow fur; and the secretions of the mouth are deficient. His appetite is pretty good, but after taking food he experiences a sensation of weight at the stomach, and frequently vomits. He is much troubled with flatulence; his bowels are usually confined; and he suffers much from thirst. *Hepatic dulness.*—Superficial, $3\frac{1}{2}$ inches; deep, $4\frac{1}{2}$ inches. There is no ascites or tumour.

Circulatory system.—The impulse of the heart is most distinct between the fourth and fifth ribs, about an inch to the inner side of the left nipple, and in a line with it. The transverse cardiac dulness is $2\frac{3}{4}$ inches. On auscultation, at the apex, the second sound is reduplicated; otherwise this system is normal.

Respiratory system.—Normal.

Integumentary system.—Skin dry and rough; no rash nor œdema.

Urinary system.—Patient has a feeling of weakness across the loins, but no pain. The sp. gr. of the urine is 1010; it is alkaline in reaction, and is loaded with albumen; there is no sediment. During the twenty-four hours he has passed 64 ounces.

Reproductive system.—Normal.

Nervous system.—Patient complains of pain in the head, more severe on the right side; sometimes dull and aching in character; at other times of a more shooting nature. His hearing is dull on the right side; his eyesight is bad, being much more deficient in the right than the left eye. On ophthalmoscopic examination, the usual appearances of albuminuric retinitis were seen.

He was ordered a quinine mixture.

Progress of the Case—17th March.—He has passed 60 ounces of urine during the twenty-four hours. He fails to keep any food

on his stomach. His eyesight is worse, and the pain in the head more severe.

18*th*.—Urine 58 ounces. No improvement has taken place.

19*th*.—Patient's condition is no better. Ordered 10 grains of bismuth three times a-day instead of the mixture. Urine 38 ounces.

21*st*.—He continues to get worse; there is greater indistinctness of vision, and the pains in the head are getting more severe. He suffers from great pain in the stomach, especially at night, and is much troubled with flatulence. The vomiting still continues. He has passed 26 ounces of urine during the twenty-four hours; tongue large and flabby; bowels confined; ordered an enema.

22*d*.—Urine 20 ounces. His condition is unimproved. Ordered infusion of digitalis internally and externally, and the bitartrate of potash electuary.

23*d*.—Urine 34 ounces. Patient is no better.

24*th*.—Urine 40 ounces. The symptoms remain unrelieved. Ordered 20 grains of the compound jalap powder night and morning.

25*th*.—The powders have not acted very freely, and patient is in much the same condition. Urine 34 ounces.

26*th*.—At four o'clock this morning there was violent retching and vomiting of coffee-ground matter, together with some unaltered blood. At six o'clock he became delirious, but there were no convulsions; he tossed himself about in bed, and spoke thickly and incoherently; he complained of burning pain in the stomach, which was relieved by ice. The back of his head was shaved, and croton oil applied, and he was dry-cupped at the back of the neck. The delirium continued till nine o'clock, when he again became rational. At twelve o'clock (noon) a castor-oil enema was administered, but very little feces were discharged. 8 P.M.—Patient has passed no water for twelve hours; he has vomited dark matter twice during the day; his pulse is 92, full, hard, and regular.

27*th*.—Patient has had a better night, and feels rather better to-day. No effect is apparent on the scalp from the use of the

croton oil. Whenever he raises his head from the pillow he vomits a quantity of dark matter. He complains of a feeling of heat across the stomach.

28th.—Patient does not feel so well to-day. The pain and heat across the stomach and the vomiting are worse, and he complains of a constant desire to pass his water. The jalap powders and infusion of digitalis are continued.

29th.—Urine 40 ounces. Sp. gr. 1015. At 1 P.M. patient was seized with a violent convulsion; his limbs were first strongly contracted, and his fists firmly clenched, and he lay somewhat on his left side. The muscles of his face and hands then began to work convulsively, the eyeballs rolled upwards and remained fixed, and bloody foam escaped from the mouth, and the paroxysm terminated with a gurgling and rattling in the throat. Three minutes after the paroxysm had passed off, his pulse numbered 125 in the minute, and was very weak, and the action of the heart was so violent and tumultuous that his whole body was shaken by it. Before the convulsion a divergent squint of the right eye was noticed, and still continues.

30th.—He has not been again convulsed. He is in a drowsy, torpid state, and can be roused only with difficulty, answering in a semi-conscious manner, but yesterday he was able to recognise his brother. He was very restless last night. The twitchings of the face continue; his tongue is much swelled from his having bitten it. Has taken some milk and some gin-and-water. His bowels are confined, and his skin very dry. There is no cedema of the ankles. He has passed no urine since 1 A.M.

31st.—He has had no more convulsions. At 1.30 P.M. yesterday he passed 18 ounces of bloody urine, and at night he passed more water, but that was free from blood. He is not in such a drowsy state as yesterday, but is rather restless, especially during the night, when he was very noisy, roaring out very loudly. He was able to recognise his friends.

1st April.—Patient still wanders, and talks incoherently, and is in a semi-conscious state. His tongue is covered with a dense white fur, his bowels are very relaxed, and he passes his water in

bed, so that the amount cannot be ascertained. Patient is lying quietly in bed, but at night he is very restless and noisy.

2*d.*—To-day at visit he is very quiet, and answers questions quite rationally, but he is very weak and pale. Pulse 92, regular, but very feeble. During yesterday he bled from the nose slightly more or less all day. The muscular twitchings still continue both in the limbs and face; his tongue is white, and his appetite bad. He passes his urine and feces in bed, and on account of the diarrhoea he was ordered an astringent mixture.

3*d.*—Last night he was very violent, tearing everything within his reach, and attempting to bite all who came near him, and it was with great difficulty that he was kept in bed. This morning, however, he is quiet and drowsy, and when roused answers questions quite rationally. The diarrhoea continues, and his urine is passed in bed, and the nurse believes it to be diminished in quantity, but free from blood.

4*th.*—Patient was very violent again last night, and he is still very restless this morning, frequently moving from side to side, throwing about his limbs, and attempting to get out of bed. He is constantly picking his nose, so that it has been bleeding more or less all night. He keeps his teeth firmly clenched, and frequently grinds them together; he will not put out his tongue, nor answer any questions. His pulse is very weak, but cannot be counted owing to his restless state. The diarrhoea is no better, and he still passes his motions and water in bed. It is with great difficulty that he can be made to take his beef-tea and chicken soup.

5*th.*—He again passed a very bad night, frequently shouting and raving, and attempting to get out of bed, and there was considerable bleeding from the nose. This morning he is very restless, and there are occasional twitchings of the limbs; he frequently gives utterance to loud cries. His pulse numbers 104, and is very feeble.

6*th.*—At 1 A.M. this morning patient was asleep, but rather restless, occasionally muttering and uttering a cry. According to

the nurse's statement he passed a very restless night, and towards 6 A.M. he became very noisy, shouting and swearing vociferously, and bounded out of bed; but towards 6.30 he became gradually unconscious, and at 6.50 A.M. he died.

7th.—Post-mortem examination twenty-eight hours after death. There was no dropsy. The heart was somewhat enlarged; weighed 16 oz.; the left ventricle was distinctly hypertrophied. The aortic valves were competent; the margins of the mitral valve were slightly thickened, but the valve was competent. The left lung was somewhat adherent posteriorly; the lower lobe was congested and œdematous, some parts being in a state of solid œdema. The right lung was also congested, the lower lobe being œdematous and friable. The bronchi contained a large amount of fluid, the mucous membrane somewhat congested. The liver was considerably enlarged, the capsule in some parts thickened, and on the surface were several cicatrices; it weighed $4\frac{1}{2}$ lbs. The spleen was small, and weighed 3 ounces; and the capsule was somewhat thickened. The left kidney was somewhat small, the capsule stripped off readily; the surface of the organ was granular and rough, with here and there sebaceous-looking material. On section, the cortical substance was found to be relatively diminished. In some parts sebaceous-looking material occupied the convoluted tubules; the cones were natural. The right kidney was smaller than the left; weighed about 4 ounces; the capsule stripped off readily. There was a considerable amount of sebaceous-looking material in the convoluted tubules, seen both upon the surface and on section. On microscopic examination with a low power, a considerable number of the tubules of the cortical substance was seen to be blocked up with opaque fatty matter. On examination with a higher power, it was found that, while many of the tubules presented a natural appearance, many, particularly towards the surface, were occluded with fatty exudation, and some were in different stages of atrophy; the tubules, on transverse section, instead of appearing round or oval, were somewhat angular, and the lumen blocked up, while many were of obviously smaller calibre than normal. Some of the smaller arteries were thickened.

The malpighian bodies presented no abnormality. The fibrous stroma was, relatively to the other elements, more abundant towards the surface ; but there were no expanses of fibrous tissue, such as are seen in examples of the contracting kidney. The mucus membrane of the stomach was of a slate-gray colour, mamillated, and covered with catarrhal mucus. The small intestines were normal. Large intestine—the mucus membrane was catarrhal, and there were some small ulcers in the ascending and transverse colon. The Peyer's patches presented the "shaved-beard" appearance. The brain was pale and œdematous, otherwise normal, so far as was seen by the naked eye.

Commentary.—There are several points in connection with this case which appear worthy of special attention. First, the close resemblance between its symptoms and those of cirrhotic kidney. So close was this resemblance that, apart from the history, I should have diagnosed that form rather than the inflammatory. For there was no dropsy ; the water was in fair quantity, and of low specific gravity ; and the affections of the nervous system—the uræmia and the retinitis—were such as are commonly met with in the contracting form. But the history was perfectly definite. There had been no sign of disease prior to the inflammatory attack five years before, and from that time the patient never had been well. He suffered frequently from œdema of the limbs, as well as from other symptoms of renal disease. The case was thus evidently primarily one of inflammation, and there was no evidence to show that the character of the process was changed. Indeed, the later history closely corresponded to that which I had observed in

another case of long standing inflammatory disease, which is still under my care.

Some might maintain that here a contracting process was superadded to the inflammation; that the man, having first suffered from an attack of inflammatory Bright's Disease, subsequently became affected with cirrhosis; and that the pathological condition, and the clinical history, resulted from this combination. But such a suggestion appears to me, on the whole, opposed to the pathological appearances as well as the clinical history. It will not be denied that the death was due to the renal affection, and not to any intercurrent illness; but cirrhosis is never, so far as I have seen, fatal at so early a stage as had been reached in Campbell's case. The kidneys were not reduced much below their natural size and weight. In all the fatal cases of the purely contracting which I have observed, the diminution of bulk was much greater. Again, the microscopic characters of the kidney, while in so far resembling, towards the surface of the organ, those of cirrhosis, differed markedly in this, that while the connective tissue was relatively increased as compared with the glandular structures, it did not appear to be absolutely above its normal amount. The conditions of the tubules, also, was different from what occurs in cirrhosis. They exhibited every stage of transformation, from full distention with exudation and fatty epithelium to atrophy, and that apparently not from constriction by connective tissue around

them, but from the gradual absorption of their contents.

I do not think it necessary to dwell upon the very important gastric and intestinal complications met with in this, as in so many cases of long standing renal disease. It may be asked, How comes it that dropsy was absent in this case while it is so characteristic a symptom of inflammatory Bright's Disease? To this I can only answer, that I have seen it wanting in other cases where advanced inflammation existed. But I think it may be understood, if we consider that in such cases the inflammatory process had become comparatively inactive, and from the compensatory action on the part of the unaffected portion of the organs, the quantity of water had reached its normal standard, and thus dropsy has disappeared. But whatever may be the explanation of the fact, the fact remains, that at this stage dropsy may be as completely absent as in a purely waxy or purely contracting case.

The fact that dropsy was absent suggests a consideration of the cause of that symptom in Bright's Disease. If it depended upon deterioration of the blood from constant drain of albumen, we should meet with it in a late stage with greater certainty than in the early, and we should find it in the waxy and contracting as well as in the inflammatory. The fact that it is always present when inflammation is extensive and recent, and when it becomes superadded to the contracting or the waxy, indicates that some-

thing in the inflammatory process has to do with its production. Now, according to our present knowledge, as there is nothing so constant in this malady as the sudden occlusion of many tubules, and consequent arrest of the flow of urine, it appears most reasonable to ascribe the dropsy thereto.

Among the nervous symptoms, the headache and uræmia were very distinct. The latter is of much importance. The earliest symptoms occurred twelve days before the patient's death, when he became delirious, spoke incoherently, and with a peculiar thick utterance (as if there was partial paralysis of the muscles of articulation), and tossed about in bed. Previously to this the water had been diminished, and at the time of its occurrence was very scanty. During the two following days the head symptoms were less marked, but on the third day he had a convulsion. It was ushered in by a divergent squint of the right eye, which continued during the rest of his life. After the convulsion he remained in a drowsy, torpid state, and was with difficulty roused to answer questions. He spoke thickly, was very restless, the muscles of his face twitched convulsively; but he recognised his relatives. During the succeeding days the water continued scanty; there was drowsiness and noisy delirium, especially during the night. He then became more torpid, but occasionally restless and irritable, sometimes picking his nose till it bled, grinding his teeth, shouting loudly, refusing to answer questions, but apparently hearing what was said to

him, for he looked up with the stupid unfocussed gaze of a drunk man. These symptoms, alternating with loud shouting, continued till the last, when he became comatose.

This is a type of uræmia by no means unfrequently met with. There was a single convulsion, but the symptoms generally resembled rather the delirium of fever. It is a form which I have seen in all the varieties of Bright's Disease, and which, in almost every case, has been the precursor of death. Mere uræmic convulsions, on the other hand, often pass off.

It is an interesting question, To what the uræmia was due? The fact that it came on coincidently with marked diminution of the urinary secretion appears to indicate that they were related as cause and effect, and I do not know any hypothesis more satisfactory than that generally held, that the retained secretions poisoned the nerve-centres.

One of the most interesting nerve lesions in this disease, because the only one susceptible of physical examination, is the retinitis. It is of interest in this case specially, as this is the first example I have met with in the inflammatory form of Bright's Disease. The dimness of vision was most distressing, and was one of the chief subjects of complaint with the patient, and the ophthalmoscopic appearances were very distinct. Both the fatty degeneration and the minute hæmorrhages were present. I daresay that practitioners of large experience may have met more fre-

quently with this combination, but to me it is interesting as the first case I have met with.

The retinal affection may tend to throw light upon other nervous symptoms. It seems very constantly to be associated with a particular form of uræmia, and it is possible that a careful investigation of the brain substance might demonstrate the existence of similar lesions in the cerebral matter.

In regard to treatment, it was to a considerable extent, during the earlier part, conducted by my resident physician, during my unavoidable absence. The tonics, diuretics and purgatives were all indicated, and although they did not produce the effects desired, I doubt whether any other plan of treatment would have been more successful. The counter-irritation by means of croton oil was tried simply because, in at least one case of the same type of uræmia, I had seen marked improvement follow its employment.

CASE XX.—*Nephritis fatal in third stage ; general dropsy, &c.*
—E. R., a female, æt. 62, was admitted to the Royal Infirmary, under the care of Dr Haldane, in October 1865. She was then extremely anasarcous, passed small quantities of albuminous urine. Notwithstanding the use of powerful diuretics, the amount of urine continued low, the dropsy became more intense, and she died October 13th. She stated that she had been healthy until eight months before, and had then become dropsical.

Autopsy.—The body was very œdematous ; the abdomen was distended with clear serum. The pleuræ and pericardium also contained much fluid. The lungs were compressed. In both

apices there were traces of old tubercle. The heart was enlarged, the left ventricle was much hypertrophied; the valves were competent; the aorta was atheromatous, in part calcareous. The liver weighed one pound twelve ounces, its substance was congested. The spleen was small. The kidneys weighed together nine ounces. Their surface was granular. On section, their cortical substance was found to be infiltrated with fatty sebaceous-looking matter, and in a state of commencing atrophy. On microscopic examination many of the tubules were found to be fatty and some in a comparatively natural state. The intestines were very œdematous.

Commentary.—This case had lasted about eight months, and the third stage of the disease had been reached. The hypertrophy of the left side of the heart had resulted partly from the atheroma of the vessels, and partly from the renal affection. The death was due mainly to the intense dropsy, which was in part referable to the disease of the circulatory system, in part to the renal affection.

CASE XXI.—*Nephritis, fatal in third stage; general dropsy, &c.*—E. T., æt. 30, was admitted to the Royal Infirmary, under the care of Dr Haldane, April 3rd, 1865. In summer 1864 she had caught cold, in consequence of which her urine diminished in quantity, and became high-coloured. Dropsy then supervened. She never fully recovered. While under treatment she had dropsy to a considerable extent, and died from exhaustion.

Autopsy.—The body was œdematous. The pleuræ, pericardium, and peritoneum contained clear serum. The heart was enlarged and dilated. The left side was much hypertrophied. The right side was dilated. The valves were free from disease. The lungs were partially collapsed, from the pressure of the dropsical fluid, but their margins were emphysematous. The liver weighed two

pounds six ounces. Its capsule was thickened. The spleen was natural. The kidneys weighed together seven ounces. Their surface was granular; the capsule peeled off readily. On section, the cortical substance was found pale, fatty, and partially atrophied. Many of the tubules contained fatty matter within the epithelial cells.

Commentary.—The case afforded an excellent example of this form of disease in an advanced stage. The organs were considerably reduced in size. The marked hypertrophy of the heart appeared to depend mainly upon the renal affection. The disease had lasted fully a year.

CASE XXII.—*Nephritis, repeated acute attacks, fatal in the third stage, with uræmia and general dropsy.*—P. M., æt. about 30, had been for upwards of a year under Dr Haldane's observation in the Royal Infirmary. Early in 1864 he had acute nephritis, from which he gradually recovered. He then had repeated acute exacerbations, and ultimately came into the hospital with severe general dropsy and diminished flow of urine. The urine was very albuminous, and contained many fatty and hyaline casts. The quantity of urine did not increase, uræmic convulsions came on, and death ensued on January 5th, 1865.

Autopsy.—There was general anasarca, and dropsy of the serous cavities. The lungs were oedematous, contained some carbonaceous deposit, and the bronchi were congested. The heart was enlarged; the left ventricle was much hypertrophied, the right dilated; there was no valvular disease. Both the liver and spleen were congested. The intestines were congested, otherwise natural. The kidneys were of about the natural size; their surface was granular, mottled, and opaque; the capsules were somewhat adherent; the cortical substance was relatively somewhat diminished in size. On microscopic examination many of the

tubules were found full of dark fatty matter, while some had natural epithelium. The brain was somewhat œdematous; the arteries at its base atheromatous.

Commentary.—In this case the disease had lasted fully a year, and the third stage had been fully established. The hypertrophy of the heart was in part due to the renal affection, and in part to the disease of the arteries.

CHAPTER IV.

THE INFLAMMATORY FORM.

NATURE OF THE SYMPTOMS.

THE symptoms which deserve special notice are those connected with the urine, the dropsy, and the affections of the nervous system.

I. The *urine* is in the earlier stages and during exacerbations diminished in quantity. It is commonly dark, smoky, or bloody in colour; albuminous; and contains tube-casts. The diminution of its quantity depends upon the congestion, and the occlusion of the tubules. The experiments of Hermann¹ very clearly explain the mechanism. He demonstrated that as the flow of urine along the tubules and outwards depends upon the blood pressure within the vessels being unopposed by any counter pressure in the urinary tract, the application of such counter pressure, as by obstructing the ureter, diminished the excretion. Now, it is clear that occlusion of the tubules must produce such counter pressure, and the quantity of urine be proportionately diminished.

In more advanced stages, when the disease is

¹ Ueber den Einfluss des Blut-druckes auf die Secretion des Harns. Henle und Pfeuffer's Zeitschrift. Dritte Reihe.—B. xvii, s. 1.

quiescent, the quantity of urine may attain or even exceed the natural, and there is often such irritability of the bladder that the patient has to get up frequently during the night, and is often called to micturate during the day. This more copious secretion appears to be a natural result of increased blood pressure, due, on the one hand, to hypertrophy of the heart, on the other, to the closure of capillaries which attends the atrophy of the organ, and not overcome by counter pressure from obstructed tubules,—many of them being clear in patients who live long enough to reach this stage.

The albumen and the blood escape from the renal capillaries in consequence of the inflammatory action, just as they do from those of the lungs in cases of pneumonia. It has been proved by Dr Robinson of London (formerly of Newcastle), and I have satisfied myself by experiment of the correctness of his statements, that tying a renal vein leads to extreme congestion of the corresponding kidney, and the escape of albumen, fibrine, and blood into the tubules; and it is certain that from other forms of congestion, and especially the inflammatory, the same results follow. But why do we find albumen still present in these advanced stages when inflammation has apparently ceased? It may arise from various circumstances. In some cases a certain degree of inflammatory action may continue throughout the whole course of the disease. If a considerable portion of the kidney is shut off from action, that which continues to act may well be

supposed to be subjected to an amount of blood pressure sufficient to lead to the transudation of albumen along with the water of the blood. It seems very reasonable to suppose, as has been suggested by some, although I do not know that it is capable of demonstration, that when the basement membrane has been denuded of its epithelium, the albumen of the blood may more readily transude through the capillary walls, and if we had evidence that many tubules are in this condition in the more advanced stages of the disease, this, also, might be accepted as a partial explanation. But I have not seen evidence of the existence of such a condition. Lastly, it has been suggested that the albumen of the blood may be so altered in its diffusibility that it may transude through the capillary walls.

The *Tube-casts* are composed of coagulated fibrine, with altered renal epithelium, and not unfrequently blood corpuscles. Their characters are very various, but the following are the chief varieties:—

1. Bloody casts, in which, along with fibrine and, it may be, epithelium, blood corpuscles are present.—*Plate IV, fig. 1.* The presence of such casts implies the rupture of small vessels.

2. Granular epithelial casts, in which there are numerous epithelial cells along with the fibrine. The cells are for the most part granular and opaque, presenting the characters of the unhealthy epithelium, as described under the head of morbid anatomy.—*Plate IV, fig. 2.*

PLATE IV.

FIG 1



FIG 2



FIG 3



FIG 4



3. Hyaline casts, which are simply fibrinous. They vary much in size, and it appears that they are sometimes formed in the lumen of tubes still lined by epithelium, sometimes in tubules whose epithelium had been removed.—*Plate IV, fig. 3.* It is very unfortunate that the term “waxy cast” has been applied to this form, for it has no connection whatever with the waxy degeneration.

Such are the forms of casts met with in the first stage; in the second and third stages the blood casts do not as a rule occur, and the epithelial are less numerous, the prevalent forms being the fatty and the hyaline.

4. Fatty casts are those in which the epithelial cells contain fatty granules; in some cases the cells thus degenerated are so numerous that the whole mass appears composed of fatty matter; in other cases they are mingled with more or less hyaline material. In many instances, particularly when the disease is well advanced, casts occur composed almost entirely of fibrine, with only a fatty cell, or a group of fat granules representing a cell, here and there.—*Plate IV, fig. 4.* The hyaline casts in the advanced stages are often of large size.

In the first stage, and sometimes in the more advanced conditions, the urea is diminished, but I have found in several cases in the second and third stages that its quantity was natural. The chlorides are diminished in the early stage, as are also the sulphates, phosphates and uric acid. In chronic states

these conditions are less marked. For further information upon these points, I would refer the reader to Dr Dickinson's work.

II. *Dropsy* is an early and prominent symptom, but is generally preceded by abnormality of the urine. It is in most cases general, but is usually first observed in the feet and aneles, the eye-lids, or the scrotum. The anasarca is often accompanied by effusion into serous cavities; but such effusions do not occur without general oedema. In chemical composition it is found to be a watery fluid of low specific gravity, with little albumen, and a large proportion of salts. C. Schmidt² has shown that the amount of albumen is in so far determined by the system of capillaries through which the transudation occurs. He found it most abundant in pleural effusions, less so in peritoneal, still less in the cranial serous cavities, and least in the subcutaneous cellular tissue. Lehmann has shown that the slower the circulation in the capillaries is, the richer in albumen is the dropsical effusion. The poorer the blood is in albumen, the less albuminous is the dropsical fluid. In long standing dropsies the albumen becomes relatively greater from re-absorption of the water and salts. If the blood be rich in urea, that substance may also be found in quantity in the dropsical fluid. The dropsy may, in the first stage, be ascribed to de-

² See Uhle und Wagner's Handbuch der Allgemeinen Pathologie, dritte Auflage, s. 249. Also Lehmann's Physiological Chemistry, Cavendish Society's Translation, vol. ii, p. 318.

ficiency of albumen in the blood serum, a condition which appears to arise very early in the disease ; but it appears doubtful whether this may be regarded as the sole explanation, as dropsy is often the first symptom observed, and is frequently more marked in the commencement than it is in more advanced stages, when the blood has been deteriorated by a long continued drain of albumen. It may, again, be referred to non-elimination of water by the kidneys, and a consequently increased pressure of the blood on the walls of the systemic capillaries and veins. The greater the severity of the renal disease, and the diminution of the urine, the more acute and copious is the dropsy ; and as the renal disease subsides, and the water is again discharged by its natural channels, the dropsy disappears.

But there are cases, particularly among those following scarlet fever, in which the dropsy appears along with, or even before, the arrest of the action of the kidneys. In these it has been suggested that it arises from paralysis of the vessels of the skin and subcutaneous tissue, a result of the cold which leads to the renal affection ; but it appears more probable that the renal affection has been first established, although its direct symptoms are not yet manifest. On the other hand, as Dr Christison pointed out, an inordinate flow of urine sometimes accompanies a dropsical state of the cellular tissue. He remarks that this is most common in the middle stage of the primary disease. I have seen it in some

cases, but in most, if not in all of them, the polyuria depended upon waxy degeneration of the vessels.

As the disease advances the impoverished condition of the blood favours the occurrence or hinders the re-absorption of dropsical effusion, for diminution of albumen and increase of water in the blood constantly produce such effects. It must also be borne in mind that cardiac or other disease may contribute to the production of this symptom.

III. The symptoms connected with the nervous system are often very important, and have been admirably described by Frerichs. They may be acute or chronic, suddenly appearing with marked intensity, the patient rapidly becoming comatose, unexpectedly convulsed, or both. On the other hand, they may come on insidiously, the patient growing drowsy, the drowsiness passing into torpor, and that into coma, from which he never awakes. Many views as to the causes of these symptoms have been advanced and successively disproved, and at present it may be said that they are still unexplained.

Osborne³ sought to refer them to arachnitis, but this view was definitely set aside by the result of post-mortem examinations. Dr Owen Rees,⁴ observing that the occurrence and intensity of uræmic symptoms do not always correspond to the quantity of urine, and that the blood may be loaded with urea and yet

³ On the Nature and Treatment of Dropsical Diseases, 1837.

⁴ On the Nature and Treatment of Diseases of the Kidney connected with Albuminous Urine, by G. Owen Rees. London, 1850.

no such symptom occur, conceived that a certain thin and watery state of the blood was an essential condition for its production. But as uræmia occurs in many cases where the blood is not watery, and watery blood is not always attended by uræmia, this view cannot be accepted.

Traube⁵ has advanced an hypothesis which has attracted a good deal of attention. He points out that, —as in Bright's Disease, the blood serum being in an impoverished state tends to transude, and in consequence of hypertrophy of the heart the blood pressure in the arterial system is increased,—so when from any cause this blood pressure is suddenly increased, or the density of the blood serum is further diminished, serous fluid transudes through the small arteries, and œdema of the brain results. The result of this is, that the capillaries and veins are compressed, and the brain becomes correspondingly anæmic. The form of the uræmic attack varies according to the part of the brain which is so affected. If the cerebrum alone is involved, coma appears; if the pons varolii and medulla oblongata alone, convulsions; if both together be affected the result is combination of coma with convulsions. This hypothesis is certainly well worthy of being carefully investigated, for the condition of the brain met with in fatal cases of uræmia often accords with it, at least in the chronic cases in which death occurs from uræmia. But I have some

⁵ Gesammelte Beiträge zur Pathologie und Physiologie, Von Dr L. Traube, band ii, s. 551.

difficulty in accepting it as explaining uræmia in acute cases. It is to be remembered that its author does not claim for it any position higher than that of a mere hypothesis.

Munk has obtained by experiment some results confirmatory of Traube's idea, for he states that he produced uræmic attacks in animals by tying the ureters and the jugular vein, and shortly afterwards injecting water, and again he prevented this occurring where, by tying the carotids, he prevented the excess of blood pressure on the brain.

Most authors ascribe uræmia to the retention in the blood of some excrementitious material. Urea was the first substance blamed, for Prevost and Dumas⁶ had proved its presence in the blood of animals whose kidneys had been extirpated, and Christison and others recognised it in that of uræmic patients. But Bauquelin and Segalas⁷ injected this substance into the veins of dogs and rabbits without leading to any result beyond an increased secretion of urine. As, on the other hand, they found that the injection of pure urine was fatal, they concluded that all the elements of the urine together constituted the poison. Bichat and others, however, injected filtered urine without injury. Uric acid, urate of soda, and ammonia were injected with like results.

Frerichs⁸ advanced the theory that the symptoms

⁶ Quoted by Frerichs, *op. cit.*

⁷ *Magendie Journ. de Physiologie*, vol. ii, p. 354.

⁸ *Op. cit.*, p. 198 *et seq.*

depend on decomposition of urea into carbonate of ammonia and water, which decomposition he ascribed to the action of a ferment in the blood. Urea might accumulate for long in the blood of patients affected with Bright's Disease, but would lead to no injurious influence unless a ferment were introduced, and then the symptoms would be rapidly developed. He sought to prove this view by showing that injection of carbonate of ammonia leads to such symptoms, and that carbonate of ammonia is present in the blood of all uræmic patients. These results were in all points confirmed by Dr Petroff of Dorpat, who, in an elaborate memoir, supports Frerichs' view.⁹ Dr Treitz¹⁰ supposes that carbonate of ammonia is the poison, but that it is not formed, as Frerichs supposed, in the blood, but in the alimentary canal; for, he says, when the kidneys do not act, the urea is eliminated by the bowel, there decomposed, and it may again be absorbed into the blood and produce uræmia.

Oppler¹¹ has found, however, that the symptoms resulting from carbonate of ammonia are by no means identical with those seen in uræmia, and able chemists have failed to discover the salt of ammonia in the blood of the uræmic. Oppler found that there is a retention of the products of muscle waste in cases of Bright's Disease, and conceives that there may be a

⁹ Virchow's Archiv., bd. xxv, s. 91.

¹⁰ Prager Vierteljahrschrift, 1859.

¹¹ Virchow's Archiv., 1861, band xxi, s. 260.

similar retention of the products of nerve waste, and to the deleterious influence of this substance he would incline to ascribe the symptoms.

The experiments of Oppler¹² and Zalesky¹³ make it appear that urea is formed by the kidneys from nitrogenous materials in the blood,—a fact which, if it be confirmed by other observers, will afford further evidence against the earlier theories. Perls and Schottin have confirmed these views.

Since the theories of Frerichs and Traube, no very definite one has been advanced, excepting that of Dr Oppler. One of the most recent writers, Dr Rommelære,¹⁴ of Brussels, conceives that the nervous symptoms are not to be ascribed to one cause, but to many causes combined; for, he remarks, when the functions of the kidney have been interrupted, not only does the waste azotized matter cease to be eliminated, but water accumulates in the system, causing impoverishment of the blood, and increased tension of the blood vessels. To the combined action of all of these the nervous symptoms are referable.

It has often occurred to me that some forms of uræmia may be associated with structural changes in the brain, similar to those which occur in the retina in cases of albuminuric retinitis. The same idea has

¹² Loc. cit.

¹³ Untersuchungen ueber den Uræmischen Process, Tübingen, 1865.

¹⁴ De la Pathologie des Symptomes Uræmiques. Bruxelles, 1867. Quoted by Dr Bennett, Principles and Practice of Medicine, 5th edition, 1868.

been advanced by Dr Argyll Robertson, but no confirmatory observations have as yet been made.

Notwithstanding the extraordinary amount of attention which has been given to this subject, further observation and experiment are still required for its satisfactory elucidation.

CHAPTER V.

THE INFLAMMATORY FORM.

COMPLICATIONS.

IN considering the complications of any particular disease, we should distinguish the following varieties :—

1st, Such as result from the malady,—Consequent Complications.

2d, Such as cause the malady,—Causal Complications.

3d, Such as owe their origin to the same cause as leads to the malady,—Concomitant Complications; and we might add, as a fourth class, diseases which accidentally co-exist with the malady,—Casual Complications.

The complications of inflammatory Bright's Disease are numerous and important, and afford illustrations of all the classes above referred to. We shall consider them in their order.

(a) *Consequent Complications.*

1st, Hypertrophy of the Heart.—This has long been recognised as a complication of renal disease. I

have found it present in 57 per cent. of a series of cases of nephritis, fifty-one in number, that I examined in the Royal Infirmary, but of these 17 per cent. were affected with other changes capable of accounting for the lesion; still, in 40 per cent. of all the cases it was present, and was apparently solely referable to the disease of the kidney. Further, on examining its relationship to the different stages, I found it specially frequent in the more advanced ones, for while in the cases fatal in the first stage it occurred only in 12 per cent.; of those fatal in the second stage it was present in 38 per cent.; and of those in the third in 100 per cent. Thus it presents in an eminent degree the most important characteristic of a consequent complication, viz., that it increases in frequency as the disease advances. It certainly is curious that all the cases in the third stage should have presented this complication, and without any cause except the renal malady; but it shows, on the one hand, how unfailingly long-standing disease in the one organ leads to an affection of the other, and, on the other hand, how patients who have at the same time valvular disease of the heart and inflammatory Bright's Disease do not live to reach the third stage of the latter affection.

The cause of this hypertrophy is probably the impurity of the blood. The blood is impure, because the natural eliminant action of the kidneys is diminished; and we know that an impure blood is circulated with greater difficulty than the healthy fluid. In order to overcome this difficulty, the heart en-

larges, in accordance with the law which we find prevailing everywhere in the body, that increased function leads to increased growth. Another explanation has been suggested by some authors, who refer it to obstruction to the circulation in the kidneys. The view derives some support from such facts as that recorded by Dr Roth,¹ of Bamberg, of hypertrophy of the heart being produced by disease of one kidney; but the other view seems on the whole more consistent with the facts ascertained.

2d, Affections of the lungs and bronchi.—Two pulmonary diseases occur not unfrequently in combination with this renal disease, viz., congestion and œdema of the lungs and bronchi, and pneumonia.

(a) Congestion and œdema of the lungs and bronchi.—This is a frequent complication, and often is the immediate cause of death. It may be acute, advancing with great rapidity, or chronic, slowly and insidiously increasing. In my series of cases of the inflammatory form it was present in 64 per cent. Frerichs, on the other hand, found it only in 25 per cent. Other writers have regarded bronchitis as a frequent complication; but I have found a truly inflammatory condition of the bronchi exceedingly rare. That mucus or watery fluid is frequently present in large quantity is certainly true, and the existence of this fluid, of course, produces most of the symptoms and physical signs of bronchitis; but this

¹ Wurtzburg. Medic. Zeitschrift, 1866, p. 204. Quoted in Schmidt's Jahrb., 1866.

appears to be connected with oedema rather than inflammation, for I have found generally, when the mucus had been washed off by a stream of water, that a healthy or simply congested condition of the mucus membrane existed. It was specially frequent in the cases which proved fatal in the first and third stages of the disease, occurring in 75 per cent. of the former, and 85 per cent. of the latter. It is evidently a local manifestation of the general dropsy. But clinical experience seems to prove that true bronchitis is a more common complication than pathological observation led me to suppose.

(b) *Pneumonia*.—This complication was present in 21 per cent. of my cases; was most common in the second stage; and about equally frequent in the first and third stages. This circumstance renders it doubtful, I think, whether it can be regarded as a consequent complication of the class to which cardiac hypertrophy belongs, viz., those depending upon abnormalities of the blood, constantly increasing as the disease advances. At the same time, it should be borne in mind that this may not be the only class of consequent complications. For it is quite conceivable that as symptoms manifested in the early stage of a disease sometimes disappear as the malady progresses, so complications which are truly consequences may occur in the early stages, and be absent in the more advanced. It may be that the system comes afterwards to tolerate irritating materials, which, when first introduced or retained in excess,

produced marked effect. We may thus conceive that pneumonia prevails more in the early stages than in the most advanced, and is yet a consequent complication. In many cases, again, the pneumonia is a causal complication, as I shall show further on. In others, again, it is a concomitant, as when both result from a blood poison, *e.g.*, that of pyæmia. In other instances, again, it has seemed to me that the two diseases were merely casually associated. From these considerations, it appears that the number of cases in which pneumonia is a consequent complication are much fewer than my tables would at first sight indicate. Competent observers, however, have conceived that a very marked connection exists between the two diseases—that pneumonia is a common cause of death in nephritis, and directly results from the renal malady.

3d, Inflammation of serous membranes.—These affections have been commonly regarded as among the most serious and fatal complications of Bright's Disease. Sir Thomas Watson says,² "Intercurrent acute inflammation is not an uncommon cause of the patient's death. The pleura appears to be much more often affected in this way than either the peritoneum or the pericardium." Frerichs found pleurisy in 12 per cent., peritonitis in 11 per cent., and pericarditis in 4 per cent. of his cases. Rosenstein, again, found pleurisy in 16 per cent., peritonitis in 8 per cent.,

² Watson's Practice of Physic, 4th edition, vol. ii, p. 682.

and pericarditis in 7 per cent. Among my cases I found about 14 per cent. of pleurisy, 7 per cent. of pericarditis, and no case of peritonitis. My results thus in so far confirm those of the German observers and the remarks of Sir Thomas Watson; but it is curious to find that it is specially associated with the earlier stage of the disease, for all the cases of pericarditis were with the first stage, and while 7 per cent. of those of pleurisy were in that, only 3 per cent. each occurred in the second and third respectively. Thus the most important characteristic of one class of the consequent complications is wanting in the case of the serous inflammations.

4th, Derangements of the alimentary tract.—Changes similar to those met with in the kidney not unfrequently occur in the tubules of the stomach, but in not a few cases, on post-mortem examination, the stomach is found little changed. Dr Fenwick³ states that in the majority of those dying from Bright's Disease we find evidence of gastritis on post-mortem examination. The mucous membrane is more vascular, the tubes are readily separated, but are distended with a confused mass of cells and granular material, the basement membrane is sometimes thickened, sometimes normal. Of ten cases of this form of Bright's Disease, in which Dr Wilson Fox⁴ carefully examined the stomach, eight had an exactly

³ The Morbid States of the Stomach and Duodenum, by Samuel Fenwick, M.D., 1868, p. 177.

⁴ Medico-Chirurgical Transactions, vol. xli, p. 361.

corresponding condition of the gastric glands, and in two there was in addition thickening of the inter-tubular tissue. Dr Fenwick has shown⁵ that tubular gastritis is almost invariably present in persons who die of scarlet fever, and that the application of cold to the surface often leads to the same result. The gastric affection may therefore in many cases be regarded as a concomitant complication of the renal. But anyone who has carefully watched cases of the kind must have observed that it arises after, and as a consequence of, the kidney disease—probably as a result of irritation by the excrementitious matters retained in the blood.

During life the digestive organs are much affected. Patients in all stages of the disease often complain of nausea, loss of appetite, and vomiting, particularly in the morning. Sometimes, in severe cases, the vomited matter has an ammoniacal odour. These derangements are often little amenable to treatment. Sometimes diarrhoea occurs in this form of disease to a very serious extent, especially in the advanced stages. I have seen it so severe in one or two instances as to be dangerous to life. It not unfrequently attends or ushers in uræmic symptoms.

5th, Diseases of the brain.—The affections of this organ which have been most commonly recognised as complications, are sanguineous and the so-called serous apoplexies. But I confine my attention to

⁵ Op. Cit., p. 92 *et seq.*

the former class, having found, like most other recent pathologists, that the anatomical conditions which used to be regarded as characteristic of serous apoplexy are commonly met with in diseases accompanied with no apoplectic symptoms, and are not always to be found in cases whose clinical history would have led former observers to expect them.

Sanguineous apoplexy occurs as a fatal termination in a certain proportion of the cases of this form of Bright's Disease. It occurs, moreover, with increasing frequency as the disease advances; for while among my cases fatal in the first stage it occurred in none, it was met with in 7 per cent of those fatal in the second, and in 14 per cent. of those fatal in the third. Doubtless, the embarrassment of the circulation, the defective nutrition of the vessels, and the hypertrophy of the heart, contribute to the frequency of the complication.

6th, Affections of the eye.—Two forms of eye affection are met with as complications of this disease, viz., the uræmic amblyopia and the albuminuric neuro-retinitis. The former occurs in acute cases and during the earlier stages, particularly in cases associated with pregnancy. It consists in sudden and often temporary diminution or loss of vision, and is unattended by any change in the retina recognisable by the ophthalmoscope. The latter is a very rare complication of the inflammatory form, although of frequent occurrence in the later stages of the cirrhotic. I have met with it only in one case of this form; and

shall defer a description of it until I am considering the complications of the cirrhotic form. In the albuminuria of pregnancy a condition of the retina similar to the true albuminuric neuro-retinitis occurs. By the ophthalmoscope it is indeed often undistinguishable from it. Its peculiarity is that it frequently terminates in resolution.

7th, Morbid conditions of the blood.—These changes are well entitled to be regarded as consequent complications, but it must be acknowledged that little or nothing of importance has been added to the observations which Dr Christison recorded in 1829 and 1839.⁶ He showed that in the early stage the blood is characterised by the low density of its serum, the deficiency of albumen, the frequent presence of urea, the frequent increase of fibrine, and by the proportion of hæmatosin being unaffected. The most remarkable change is the decrease of density, falling as it does from the normal 1030 to 1022, or even 1019, and the solid contents being reduced from 100 or 102 in a thousand to 68, 64, or even 61. These changes occur only when there is abundant discharge of albumen with the urine.

In the advanced stages the proportion of hæmatosin in the blood is invariably and greatly reduced. No other morbid change is constantly present, but the solids of the serum are often deficient; sometimes

⁶ Edinburgh Medical and Surgical Journal, October 1829; and Granular Degeneration of the Kidney, p. 59, 1839.

again they are in excess; and not unfrequently the serum contains urea.

(b) *Causal Complications.*

The complications belonging to this class are so important as to deserve separate consideration. They are discussed in the next chapter along with the other causes. One supposed cause only may be mentioned here, as it has been deemed important by some observers.

Tubercle of the lungs.—This affection of the lungs has been regarded by some as a cause, but is in truth not specially related to this form of Bright's Disease. It occurred only in 7 per cent. of my cases—a trifling proportion when we consider the frequency of Phthisis. It was present in 12 per cent. of the cases which proved fatal in the first stage, in 15 per cent. of those fatal in the second, in none of those fatal in the third. But while the purely inflammatory form bears no relationship to tubercle, in the combined waxy and inflammatory it is a very frequent complication, indeed, in 52 per cent. of my cases tuberculosis of the lungs existed. To this I shall refer further on.

(c) *Concomitant Complications.*

The complications belonging to this class are not

of much importance. Only those of the liver and spleen seem to me to be worthy of notice.

Affections of the liver.—It has been long known that the diseases of the liver and kidneys frequently correspond, and there are two conditions which I have found co-existing with this form of Bright's Disease, viz., fatty degeneration, which occurred in 25 per cent. of my cases, and cirrhosis, which occurred in 14 per cent. The former condition is frequently associated with nephritis in cases of blood poisoning, the secreting cells presenting identical changes in the two organs.

Affections of the spleen.—In cases like those just mentioned, the spleen is not unfrequently found enlarged and pulpy.

CHAPTER VI.

THE INFLAMMATORY FORM.

CAUSES.

THE most common exciting cause of inflammatory Bright's Disease, in the adult, is *exposure to cold and wet*. This induces its effect in many cases very speedily, and its action is greatly favoured by the existence of an exhausted state of the system. Among bakers, and other workmen whose employment renders them liable to sudden vicissitudes of temperature, the disease is specially common.

As to the mode of action of cold in inducing renal disease, various theories have been advanced. Some have supposed that, as the action of the skin and of the kidneys in discharging water are complementary one to another, a sudden arrest of either must greatly embarrass the other, a suppression of cutaneous excretion might thus suffice to inflame the kidneys. But, as Frerichs justly remarks, this explanation is unsatisfactory, seeing that when much fluid is taken into the system the kidneys may be made to excrete twice the natural amount of water, and no inflammation result. Another view is that which Dr Johnson¹

¹ Dr George Johnson on Diseases of the Kidneys. London 1852.

so ably supports, that the defective action of the skin causes certain deleterious matters to accumulate in the blood, and that thus the burden of their elimination—a burden which necessarily proves injurious—is thrown upon the kidneys. If it be true that the skin secretes considerable quantities of urea, and that the sweat contains other elements which make it appear closely allied to urine, it may well be believed that a sudden suppression of its action may lead to irritation of the kidney; at the same time, it is remarkable that well marked renal symptoms may appear almost immediately after exposure to cold. Dr Fourcault² has shown that as general suppression of cutaneous transpiration (produced by varnishing the skin) leads to cutaneous asphyxia, so a partial suppression by the same means gives rise to febrile symptoms and albuminuria. Another view would refer it to the reflex influence of the nervous system—explaining it as we are accustomed to explain many cases of pneumonia, pleurisy, gastritis, catarrh of the intestine, and other diseases. It is true that we cannot tell why the kidneys should be specially affected rather than other organs, still it can scarcely be doubted that the disease is sometimes produced in this way. Probably in some cases the true explanation is to be found in the second, in others in the last mentioned, theory.

² Causes Générales des Maladies Chroniques; and British and Foreign Medico Chirurgical Review, vol. xx, p. 106.

Another great cause of this malady is the presence of *morbid poisons in the blood*. The morbid poisons which are specially active in this way are those of scarlatina, diphtheria, erysipelas, measles, pyæmia, typhus, cholera, ague, rheumatism, and that which leads to acute atrophy of the liver. The scarlatinal poison is, of all these, the most important, because the most frequent originator of the malady. In children, indeed, it is by far the commonest cause of the disease. The nephritis may occur at any time, from the commencement of the fever until the desquamation has been completed. The most common period for its commencement is from the end of the first week to the fourth; but the danger cannot be said to be over before the end of the second month. In a very large proportion of cases albumen occurs in the urine at some stage of the fever, but the actual nephritis generally results from exposure to cold, and is therefore specially apt to occur in mild cases, and during convalescence.

In pyæmia I have found the kidneys very constantly affected, but not in an advanced stage, death generally occurring before there was time for all the characteristic changes to be manifested.

After erysipelas and measles I have repeatedly observed nephritis arise.

The co-existence of renal disease with acute atrophy of the liver I shall consider in a supplementary chapter at the end of this work.

In all of these cases the inflammation appears to

result from the irritation of the kidneys by the morbid poison which causes the primary disease, that poison irritating the kidneys perhaps during the process of elimination.

Occasionally, too, we find nephritis resulting from the presence of irritating substances introduced into the body from without, as cantharides, copaiba and cubebs, oil of turpentine, and, some would add, alcoholic drinks. Bouillaud³ carefully investigated the effects of cantharides, and found that almost constantly after the application of large blisters to the skin albumen appears in the urine; and in the dead body, along with a general congestion of the urinary tract, he found the kidneys much congested, with numerous little extravasations throughout their cortical substance.

Reinhardt⁴ relates two cases which were due to the excessive use of balsam of copaiba and cubebs. Both were in weakly individuals, and one proved fatal.

Similar observations have been made as to the action of oil of turpentine.

With regard to the abuse of alcoholic liquors, it appears that much as such a habit may predispose to renal inflammation, there is no evidence to show that it is capable of directly exciting it.

Another important cause of nephritis is internal

³ Archives Générales de Médecine, 4me série, tome xvii, p. 99.

⁴ Annalen des Charité Krankenhauses Iste Jahrgang, 4tes heft; quoted by Frerichs, op. cit. s. 149.

inflammation, particularly of the lungs. This cause seems well worthy of attention, for I have found that in a considerable number of the fatal cases of pneumonia which I have examined in the Infirmary during the past four years, a greater or less degree of inflammation of the kidneys existed, and the urine was in many cases albuminous. I have recorded a very well-marked case of this kind in Chapter IV, a case in which the occurrence of the renal complication was observed from its commencement, and carefully watched throughout its course.

In diabetes mellitus it is well known that nephritis sometimes occurs as a secondary disease. I have in two cases seen it come on with such severity as to lead to a rapidly fatal result.

Pregnancy sometimes occasions this form of renal disease. Dr Lever⁵ pointed out, more than twenty years ago, that puerperal convulsions are commonly associated with albuminuria. It has since been proved that these convulsions are common in women who have become pregnant while labouring under Bright's Disease, also that during pregnancy, and probably as a result of it, in many cases the malady makes its appearance. In a very large proportion of cases it appears during the first pregnancy. According to Scanzoni's statistics of 296 cases, 235 were primiparæ. It often disappears rapidly and never recurs. But, on the other hand, it may become

⁵ Guy's Hospital Reports, 1843.

permanent, or may appear in successive pregnancies, disappearing completely during the intervals, but in such cases it usually at length becomes chronic and permanent. It may arise at almost any period of pregnancy, but is very rare before the third or fourth month, more common during the later months, sometimes coming on during labour, and after delivery. It appears from the statistics⁶ of Devillion and Regnaud, Blot and Mayer, that about one-fourth of all the cases of albuminuria have convulsions. This proportion is certainly much larger than we find in Bright's Diseases generally, and there can be no doubt that the excited state of the system, and of the circulation in particular, accounts for this. A close connection, of course, exists between the renal affections and puerperal convulsions; but, on the one hand, it is certain, as has already been said, that albuminuria may exist during pregnancy, and yet be unattended by convulsions; and, on the other, that the convulsions may precede the albuminuria, or even sometimes occur independently of any renal symptoms. It is to Dr Braxton Hicks⁷ that we are indebted for showing that the convulsions sometimes precede the albuminuria, a fact which he has illustrated by several interesting cases.

As to the mode of production of the disease, Dr Lever suggested that it depends upon pressure of the gravid uterus on the renal vessels. This view has

⁶ Quoted by Rosenstein, *op. cit.*, § 66.

⁷ Transactions of the Obstetrical Society of London, vol. viii, p. 323.

been accepted by many, but it is disproved by the facts, that the veins are often subjected to much greater pressure in cases of ovarian and uterine tumors without renal disease, and that albuminuria occasionally occurs early in pregnancy, but yields to treatment, while the pregnancy goes on to its natural term.⁸ Dr Barnes conceives the renal affection to result from the kidneys being overpowered in their effort to eliminate the excrementitious matters forming in the system. He thus regards the process as essentially corresponding to that which occurs in scarlet fever. Dr Braxton Hicks⁹ inclines to think that the renal affections and the convulsions, which so often co-exist, may both be caused by some deleterious ingredient circulating in the blood. It certainly seems reasonable to suppose that, among the peculiar tissue changes which go on during pregnancy, morbid products may in certain circumstances be evolved which are capable of leading to serious irritations of excretory and other structures.

⁸ Dr Barnes, Transactions of Obstetrical Society of London, 1867, p. 336.

⁹ *Op. cit.*

CHAPTER VII.

THE INFLAMMATORY FORM.

TREATMENT.

IN the treatment of this, as of other diseases, we must at all times bear in mind the anatomical condition of the diseased organs, and do what we can for their restoration to the normal state, while at the same time we endeavour to alleviate suffering, and obviate the tendency to death.

In this disease, then, we have to remember that in consequence of inflammatory action the blood vessels of the organ are overfilled, while many of the tubules are blocked up with altered epithelium and free exudation. These conditions, although most marked during the first stage, continue more or less during the whole course of the malady. We must therefore aim at subduing this inflammatory action, or, if this cannot be fully attained, at relieving congestion and removing from the tubules the effete material which blocks them up. By fulfilling the latter indication we at once open up the channels for the elimination of water from the body, removing the counter pressure which overcomes the blood pressure in the vessels, and afford opportunity for the growth

of new epithelium within the tubules. I have seen in a kidney the old degenerated epithelium partially removed in the form of a tube-cast from the basement membrane which enclosed it, and tender young epithelial elements growing in its place; and from this observation I think there is ground for concluding that if the tubules be freed from the effete matter, they may be fully restored to the healthy condition. On the other hand, if the effete material be left within the tubules, it must be absorbed, molecule by molecule, and the kidney permanently destroyed to a corresponding extent. If the case be so, the importance of this indication for treatment can scarcely be over-estimated. As to the other great indications, it is clear that in the treatment of this disease in its earlier stages our aim must be to get rid of the dropsy and to avoid or cure uræmia. Throughout the whole course, with or sometimes without these indications, we have to endeavour to improve the condition of the blood, and to obviate or cure the various complications.

Bearing these indications in view, we have now to inquire how they may be best fulfilled,—it is worthy of notice that one remedy or class of remedies often fulfills more than one indication. As to subduing or abating the inflammatory action, I doubt whether we have very much in our power; still I have seen results follow the use of *counter irritants* which I was unable to explain on any other hypothesis,—the most striking were in chronic cases, such as Case

VI, page 31. In acute cases I have not had much experience of their value, but am assured by Dr Graham Weir that he has found in his private practice, as well as in the Royal Hospital for Sick Children, much advantage follow their employment in such cases. Counter irritation by means of fly blisters or turpentine is obviously forbidden, on account of their tendency to irritate the kidney. I have for some time past been accustomed to employ croton oil liniment, directing a small quantity to be rubbed into the skin of the lumbar region, and repeated as soon as the first crop of pustules is healed. In some cases a stronger preparation was needed. I have seen under this treatment the albumen diminish markedly in amount, and even completely disappear. This treatment is of course very unpleasant on account of the irritation and itching of the skin which attends it, and is therefore not to be recommended in mild cases which may be expected to subside spontaneously; but from my present experience I think it worthy of being tried in obstinate chronic cases, particularly where the albuminuria continues after the disappearance of the other symptoms. The itching and uneasiness attending the eruption may be greatly relieved by the application of diluted liniment of belladonna. Although we can do comparatively little to check the inflammatory action, we can modify its concomitants and consequences.

Congestion may be diminished in various ways, most certainly by means of blood letting.

Local Blood Letting may be accomplished by means of leeches or wet cupping; the latter is generally preferred. Blood may be drawn to the extent of one to ten ounces, according to age and other circumstances. I have seen it not only relieve the kidneys, but rouse the patient from uræmic coma, and rescue from imminent death. *Venesection* I have never had occasion to employ, and it should certainly be used with caution. It has often been adopted with advantage in acute and severe cases occurring in robust individuals, especially when uræmic symptoms prevailed; the best results have often been observed in cases of uræmia occurring in the puerperal state. In a great majority of cases local depletion by means of cupping or leeches proves sufficient.

Dry Cupping over the loins is often followed by marked improvement, especially in the first stage, when the organs are much congested. It may be repeated several times in a day, and on successive days, on each occasion with renewed benefit.

Hot fomentations and poultices.—Another plan of treatment which is certainly very valuable, and which perhaps acts by diminishing congestion, is the application of poultices and hot fomentations. They should be applied as warm as can be conveniently borne, and renewed as soon as they begin to be at all cold. Whether their effects are produced by diminishing congestion or otherwise, they are certainly very marked, and should not be omitted in the treatment

of any acute case. The material of which the poultices are composed is unimportant.

The next indication which we have to endeavour to fulfil is *the removal of the exudation and effete material from the tubules*. It is worthy of note that the means which are most effective for this purpose are also most reliable for removing dropsy from the tissues and cavities, and excrementitious matters from the blood. These are *diuretics*. Some authors maintain that in the early stage such treatment must be injurious, and that in the later stages it is quite unnecessary. The ground upon which such objection is taken is, that it is contrary to the principles of medicine to stimulate an inflamed part. This view is in so far quite sound; but most practitioners will admit that some diuretics are not in any sense stimulants of the kidney, and few, even of the most strenuous opponents of the diuretic mode of treatment, would say that such a drug as digitalis is capable of promoting irritation. I have been accustomed since student days to see diuretics freely employed, and frequently with great advantage.

Digitalis is entitled to the first place among the diuretics. It is very efficient, and appears never to irritate the kidneys. It is best given in the form of infusion, in doses of from one to four drachms, repeated several times during the day, according to circumstances. It may also be given as tincture, in doses of from ten to forty minims, with or without carbonate of ammonia, or as pill, alone or in combina-

tion with squill, or, as some authorities recommend, with squill and a small dose of blue pill. The employment of preparations of mercury in this disease must be very cautiously carried out, on account of their tendency to deteriorate the blood, and the readiness with which salivation is produced. During the administration of *Digitalis* we must, of course, be watchful of the state of the circulation. It may also be administered through the skin, cloths or spongiopiline steeped in the infusion of the *Pharmacopœia*, or in a stronger solution, being applied over the abdomen. The *modus operandi* of the remedy appears now to be pretty well ascertained, and is very interesting. By increasing the power of the heart's action, and perhaps also contracting the capillaries, it materially increases the blood pressure. As the normal secretion of urine depends upon that pressure being in the healthy state unopposed by any obstruction, and the diminished flow in this disease is due to obstruction within the tubules, the *Digitalis* appears to supply such an increase of pressure as overcomes the obstruction, and, indeed, carries it away by the force of the current it originates.¹

Belladonna is stated by Dr John Harley² to be

¹ Dr J. Milner Fothergill, in his able Essay on *Digitalis* and its Uses, advocates the view which I indicate in the text. I am much pleased to have arrived at the same conclusion as has been reached by so eminent an authority in regard to the drug.

² The Old Vegetable Neurotics, by John Harley, M.D., London, 1869, p. 246.

a valuable diuretic, and to have proved in his experience of great service, both in acute nephritis and in more chronic cases, in diminishing the amount of albumen while increasing the quantity of water. I have as yet no experience of its effects. He recommends the use of from five to twenty minims of *Succus Belladonnae* three times in the day.

Acid Tartrate of Potass is often very beneficial, and may be given with the *digitalis*. It should be administered in doses of from ten to forty grains several times a day, either as a confection with treacle, or simply in water or butter milk.

Acetate of Potass, administered in doses of forty to sixty grains three or four times a day, is a most efficient diuretic, and may be advantageously combined with one or more of the other remedies.

Nitrate of Potass, in doses of twenty to thirty grains frequently repeated, is in general use as a diuretic; and, although in my opinion it is not equal in activity to the other salts above mentioned, it may sometimes be given with advantage.

Oil of Juniper, especially administered by inhalation, is sometimes exceedingly useful, and as it is a remedy which many patients like, it may be given two or three times a day in addition to other medicines. Sir J. Y. Simpson suggested this mode of administration several years ago; and for some years past I have used it, often with great success. It may be administered by dropping some of the oil upon a sponge which has been previously wet with hot

water, the vapour passing off carries with it the volatile oil, which may thus be conveniently inhaled; or any of the numerous inhalers now in use may be employed. Juniper may also be given in the form of spirit, in doses of from fifteen minims to half a drachm. As this drug appears somewhat to irritate the kidney, its action must be carefully watched. *Gin* is a popular and agreeable form for administering juniper.

Spirit of Nitrous Ether is also useful in some cases, given in mixtures in combination with other remedies, in doses of from twenty minims to a drachm.

Infusion of Scoparius is an excellent vehicle for the administration of more potent diuretics, and appears in many cases to aid their action.

Tincture of Cantharides is a good stimulant diuretic, and may be recommended in the later stages of the disease.

Water is not the least important of the diuretics, and the patient should be encouraged to take as much as he conveniently can. Its action has long been recognised, but the profession is indebted to Dr Dickinson, of St George's Hospital, London, for some interesting observations as to its value.³

It is well to administer several diuretics together, as a combination often produces the effect when individual remedies fail.

There are other methods of relieving the system

³ Edinburgh Medical Journal, 1864.

of dropsical fluids and excrementitious matters which are preferred by some physicians, who claim for them that they relieve the kidneys, and thereby induce more free action. The true place of these classes of remedies is, in my opinion, to act in an emergency by carrying off materials before there is time for the kidneys to act, or when diuretics fail to establish their action, and to take up in so far their work when disease of the kidneys is so advanced as to make them incapable of due functional activity. We shall first consider those remedies which act upon the bowels.

Cathartics.—Some authors regard these as the most valuable remedies, and certainly their employment is sometimes followed by marked improvement. But several disadvantages attend their use—they interfere with nutrition, their action is exhausting, and they cannot, for any considerable period, be employed to relieve the kidneys of their work. Their great use is, in fact, in meeting temporary emergencies. If the onset of the inflammation be so severe as completely to check the secretion of urine, or if in the course of the disease acute exacerbations lead to the same result, copious purgation may remove water from the system, and relieve the congested kidney. It is in such circumstances only that I would rely upon them, but in such I have seen them markedly beneficial.

Compound Jalap Powder is the best form of cathartic, and may be given in doses of from half

a drachm to a drachm repeatedly. *Elatarium* is praised by some, but appears irritating to the bowels and depressing to the system. It may be given in pill, in doses of from 1-12th to 1-6th of a grain. Perhaps there is more virtue in a good dose of *Castor Oil*, or of *Sulphate of Magnesia*, than some authors suppose. Dr Goodfellow recommends as a very good aperient five grains of Carbonate of Magnesia, with one drachm of Sulphate of Magnesia, freely dissolved in peppermint water. It must be borne in mind that, while the advantages which some ascribe to cathartics may be problematical, it is important always to keep the bowels free, and tending rather to looseness than to constipation.

Diaphoretics.—With some authors of deserved repute this appears to be the favourite plan of treatment, and it certainly is of great value when the kidneys are so far damaged as to be incapable of being roused to functional activity. *The Vapour* or *Hot Air Bath* is often followed by excellent results. But so far as I have seen, while it may be useful in combination with diuretics, it is not itself sufficient to effect a cure in severe cases. The best mode of employing it is the following:—The patient being well tucked in, a lamp is introduced under the bed clothes, and in many cases copious perspiration is speedily induced; or the patient may be seated in a chair, well covered with blankets. I have seen the perspiration followed by marked increase of discomfort. Much care is needed in order to avoid exposure

to cold, as bad results sometimes follow from negligence in this respect. *The Hot Bath* (98° to 112° Fahr.) is in many cases a more convenient method of acting on the skin, and is specially useful in the scarlatinal dropsy of children. The diaphoretic action of baths is greatly favoured by the administration of such fluids as warm tea or gruel.

Liebermeister and Ziemssen have sought to show that this plan of treatment is vastly preferable to any other, asserting that the skin is the organ which can be longest and best used for eliminating serum from the subcutaneous tissue and serous cavities. The latter author⁴ gives details of his method and its results. He recommends the warm bath followed by packing in flannels, and in some cases simply the warm water pack. The exact method is the following:—The patient is placed once daily in a bath at 100° Fahr.; by addition of hot water the temperature is raised to 105° or 110° . He remains in the bath from half an hour to an hour, according to his strength. The room is of course carefully heated. The patient is at once removed from the bath to bed, and there is packed in heated blankets and covered up with a feather bed. In this he remains at least from one to two hours, and drinks as much water as he likes, cold cloths being applied to the head if headache is troublesome. He is then rapidly dried and laid in a warm dry bed. If the blanket

⁴ Deutsches Archiv für Klinische Medicin. Band ii, s. 1.

irritate the skin a fine linen sheet may be interposed. The greatest care is necessary in the employment of this plan of treatment, for the slightest exposure from defect in the arrangements might be very dangerous. I have had no opportunity of fairly testing this plan, as the arrangements of the present Royal Infirmary do not admit of its being safely tried.

Of medicinal diaphoretics, the *Solution of Acetate of Ammonia* has appeared to me the most useful, and it may be advantageously combined with the diuretics. Dr Christison recommends Dover's Powder, in the dose of from five to eight grains three times a-day. He says that, in addition to its diaphoretic action, it is useful as an anodyne and calmative for removing pain, and allaying irritability and restlessness. James' Powder has also proved, in his experience, a good diaphoretic.

In many cases dropsy may be got rid of by mechanical measures; for example, by pricking the dropsical parts with a needle. The older plan of scarifying is very apt to lead to erysipelatous inflammation, but I have rarely seen any considerable irritation follow the pricking. Water often drains away from such openings in large quantities, and not unfrequently this seems to relieve the kidneys, diuresis becoming much more marked after its establishment. My colleague, Dr G. W. Balfour, has obtained very excellent results by making a few incisions on the outside of the knee. By this means he has succeeded in draining off large quantities of fluid.

With a view to protecting the skin from the irritation caused by the fluid, he coats the surface extensively with carbolic oil. This should not be omitted in any kind of puncturing. Paracentesis abdominis may also sometimes be required, and followed by much benefit.

Scarcely less important than the removal of dropsy is diminishing the deterioration of the blood. As the disease advances the proportion of blood corpuscles is much lessened. The *hæmatic tonics*, therefore, which tend to increase the blood corpuscles, are of the greatest value throughout the whole course of the disease. Among these the *tincture of perchloride of iron* is entitled to the chief place, for not only is it a most efficient preparation as a chalybeate, but it is also diuretic. It may be given in combination with nitrous ether and with digitalis, and is generally well borne. The dose is from ten to twenty minims several times a-day. If it should disagree, the *syrup of iodide of iron*, in dose of twenty to thirty minims, may be used instead. If this, too, be contra-indicated, a drachm of *Parrish's compound syrup of the phosphates* may be tried.

Another important indication is the diminution or arrest of the drain of albumen from the kidneys. *Gallic acid*, in doses of ten grains three times a-day, has been recommended by some authorities; but in my hands it has proved invariably useless. *Ergotine* has been tried, but also without success. *Belladonna* has been recommended by Dr Harley. The only

treatment of which I can say that positive advantage has resulted is the inunction of croton oil already described.

On the appearance of uræmic symptoms there is need of prompt action. In my experience, cupping over the kidneys and active purgation have appeared most useful in the cases tending to coma. In cases of a convulsive type the administration of chloroform has proved more beneficial. In advanced stages of the disease, in which the constant drain of albumen has induced anæmia, bleeding must of course, as a rule, be avoided.

In the nausea and vomiting which often accompany the disease no remedy seems to equal ice, although relief may be occasionally obtained by the use of hydrocyanic acid and other gastric sedatives. I have seen aerated waters aggravate the sickness.

In the catarrhal and dropsical affections of the respiratory passages, counter irritation and dry cupping have appeared to me useful. The inflammatory complications must be treated with a due regard to the avoidance of lowering remedies. Mercurials, in particular, as tending to impoverish the blood, are distinctly contra-indicated.

Patients occasionally suffer very severely in the chronic stages from excoriation of the skin of the legs. Relief may be obtained by frequently dusting the surface with powdered starch, or by a similar application of finely powdered prepared chalk. Perhaps the best treatment is the local application of

carbolic oil, one part of the acid to 30 or 40 of olive oil.

The *diet* during the early stages should be simple, consisting of farinaceous substances, with milk, chicken soup, beef-tea, and such like, but butcher's meat should be avoided, or given with caution. In the more advanced stages the diet should be as nutritious as possible, and then, certainly, flesh meat is by no means injurious. A moderate allowance of stimulants is useful in the chronic stages, and perhaps the best form in which they can be given is gin toddy.

Special care should be taken to guard the patient from cold—a flannel night-dress should be worn by those who are confined to bed: and in the more chronic conditions, when patients are able to go out, flannels should be worn next the skin; neglect of such precautions sometimes leads to the most serious results. In the case of patients who can afford to go abroad, a residence in the south of Europe, or even in tropical regions, may be recommended, for it is certain that the disease is less common there than in this country. It appears, indeed, that the results of such change of climate might, in this disease, be much more satisfactory than they are in cases of phthisis pulmonalis.

CHAPTER VII.

THE WAXY OR AMYLOID FORM.

MORBID ANATOMY.

WE now proceed to consider the form of Bright's Disease which originates in the vessels,—the Waxy or Amyloid Degeneration. For convenience of description, we may divide this affection also into three stages, viz. :—

1st, That of simple Degeneration of the vessels.

2d, That in which a secondary Alteration of the Tubules is superadded ; and

3d, That of Atrophy.

As we have seen that, in the first form of Bright's Disease the inflammation was the primary affection, and that the enlargement, the fatty degeneration, and the atrophy, resulted from it, so here we shall find that the peculiar degeneration of the vessels is the primary change, and that the enlargement and ultimate atrophy are but consequences of it.

Before describing the different stages, it may be well to indicate the characters of the changes in the vessels which exist in all the stages. As seen by the naked eye, the affected tissues present the appearance, more or less distinctly, of boiled starch or sago, the appearance which we see most characteristically—be-

cause in largest mass—in certain forms of the waxy spleen. On microscopic examination, either with low or high powers, the degenerated parts present a peculiar dim translucency, and are generally more voluminous than natural, while their outlines are somewhat indistinct.—*Plate V.* The iodine test affords, however, in my opinion, the most reliable evidence. When a little of the liquor iodi is poured over a surface, it everywhere produces a yellowish colour, but the degenerated parts assume a reddish brown, mahogany red, or orange red hue, and stand out very conspicuously.—*Plate VI.* It often happens that points of degeneration are by this means detected which could not be made out by mere microscopic examination, however careful. Now and then the further addition of sulphuric acid produces a beautiful blue colour in the degenerated parts, but much more commonly only a purplish hue. As the iodine test is in itself perfectly sufficient, I now rarely add the sulphuric acid. Iodine is not the only colouring matter which is specially absorbed by the waxy material; carmine, indigo, and magenta have all been found to exhibit this property, but none of them is preferable to the test first introduced by Virchow. I do not enter here into the question of the nature of the degeneration, but consider it specially in a supplementary chapter at the end of the book.

1st. The stage of simple Degeneration of the

vessels.—The vessels alone are affected. To the naked eye the organs appear natural. Their capsule is easily stripped off. The surface is smooth. In size and weight they are natural. The relative bulk of their cortical and conical parts is normal. The colour, both on the surface and throughout the organ, is natural, or perhaps a little paler than usual. The experienced eye may observe that the malpighian bodies are somewhat too distinct, and present something of the sago-like translucency; but even the most experienced may err or be in doubt until the iodine test or microscopic examination, or both, afford their more positive evidence. The degeneration commences in the capillary tufts of the malpighian bodies, and in the transverse fibres of the middle coat of the small arteries: most commonly it originates in the cortical substance, sometimes, however, it is more abundant in the straight vessels of the cones, and by no means unfrequently it affects both sets of vessels equally and simultaneously. Wherever it may have begun, it seems to be in general equally diffused throughout the corresponding parts of the organ, and sooner or later it affects most of the small arteries and malpighian tufts. All this may co-exist with little or no abnormality in the tubes. The malpighian tufts appear swollen, and the individual loops more translucent than natural. On the small arteries there are thickenings here and there, the thickened parts presenting the same translucency as is seen in the tufts, and not unfrequently a series of such nodular

thickenings, occurring along the course of an artery, gives it, especially when iodine is applied, an appearance similar to that of Ipecacuan root.—*Plates V. and VI.*

2d. The stage of Transudation into the tubules.—In this stage the organ is obviously abnormal. It is increased in bulk and weight; its capsule is easily stripped off; and the surface is smooth and pale. A few stellate vessels ramify on it, and it presents little or none of the mottled appearance seen in the second stage of the inflammatory form. On section, the cortical substance is found relatively increased, pale and dense, though not fibrous, and presents much the appearance of white bees-wax. The cones are pink, and of natural size, but the whole cortical substance has the peculiar waxy appearance, and scattered over it are numerous minute semi-translucent points, best seen when the light falls on them obliquely—the malpighian bodies. On examining a section under a low power (50 diameters) we see the malpighian bodies and the arteries degenerated as we have already described, but, in addition, we find many of the tubules full of matter, not dense and opaque as in the inflammatory form, but tolerably transparent. It must, however, be noticed that this material presents neither the peculiar translucency nor the coloration with iodine which are characteristic of the waxy degeneration, but exactly resembles the material of hyaline tubecasts.—*Plates V. and VI., fig. 4.* The basement



membrane of the tubes, and even the epithelium, are, it is said, in some cases so changed as to assume with iodine the characteristic waxy coloration. I have frequently looked for this, and have seen the cells present the swollen, dimly translucent appearance, but never the peculiar coloration. The basement membrane I have often found thickened and waxy-looking, without any coloration taking place on the application of iodine, and on a few occasions I have seen that coloration. The cells frequently contain numerous minute fatty granules.

What is the cause of the increased bulk of the organ? To a slight extent the enlargement of the truly degenerated parts accounts for it; but it is mainly due to the distension of the tubules in the manner described. This distension of the tubules most probably arises from the transudation of the fluid parts of the blood through the degenerated walls of the vessels. A slow transudation of fibrine most probably takes place; this coagulates in the tubules, and so we have a condition closely resembling that which occurs in the inflammatory form. This explains, too, the fatty degeneration of the cells. It is to the organ in this stage of degeneration that the term "waxy kidney" is most applicable.

3d. The stage of Atrophy.—In this stage the organ is reduced in bulk and weight. The capsule may be torn off without much difficulty. The surface is uneven, rough and granular, of a pale waxy colour,

but also occasionally mottled here and there with sebaceous-looking material. On section, the cortical substance is found much diminished, while the cones are nearly natural. The malpighian bodies are large, prominent, closely grouped together; the tubular structures are wasted; the smaller arteries are dilated, and their walls thickened. On examining a thin slice under a low power, we find the relative increase of the vascular elements very remarkable.—*Plates V. and VI., fig. 1B.* In some parts, and in extreme cases, I have seen the malpighian bodies so closely grouped together as to remind one of a bunch of grapes, the degenerated artery representing the stem. Tubules here and there continue distended, but most are atrophied, their walls collapsed, and represented only by fibrous tissue.—*Plates V. and VI., fig. 6.* The degree of atrophy varies in different instances, from about the natural size of the organ to a fourth, or even less.

As to the time required for these changes it is difficult to speak, for I have as yet traced only one uncomplicated case from its commencement to its fatal termination, and I am not aware that any other case has been so observed. The early symptoms are often so little attended to that it is difficult to make out the date of origin of the disease in cases which come under observation; and from the slowness of its progress patients are often lost sight of, and the accounts of their cases left incomplete. The case I have referred to lasted ten years, and the kidneys

were very considerably atrophied. I examined the kidneys in another case, which had been under my observation for three years, and they were not much smaller than those of a healthy individual. And in another fatal case I found that distinct symptoms had existed for about six years, and yet the organs were less atrophied than I have frequently seen them in case of uncomplicated waxy degeneration.

CHAPTER IX.

THE WAXY OR AMYLOID FORM.

CLINICAL HISTORY.

AN individual who has long suffered from wasting disease, such as scrofula, caries, necrosis, or syphilis, or who, though without palpable disease, is of feeble constitution, begins to feel an increasing weakness, and to pass large quantities of urine, and to drink largely. He is, contrary to his usual custom, obliged to rise repeatedly during the night to make water, and on each occasion passes a considerable quantity. The amount of urine varies from 50 to upwards of 200 ounces daily, always bearing a relation to the amount of fluid drunk, generally nearly equalling it in amount, sometimes even exceeding it. The feet and ankles may become oedematous after a hard day's work; but they return to their natural condition during the night's repose. In many cases there is observed a hardness and swelling in the hepatic and splenic regions, dependent on an increase of bulk of the liver and spleen. The patient feels a constant lassitude and unfitness for exertion. His urine gradually becomes albuminous, and a few hyaline tube-casts are to be found in the very scanty sediment which it throws down. It is of low specific gravity, 1005 to

1015. The blood in many cases presents some peculiarities when examined microscopically, the white corpuscles being somewhat increased in number, and the red presenting a flabby appearance, with a marked tendency to tail—that is to say, instead of forming into rouleaux, like healthy corpuscles, they become stretched out into a series of oval bodies. These changes I have observed only when the degeneration affected the lymphatic or blood glands. The patient may continue in this state for months, or even years,—may undergo a temporary or perhaps even a permanent improvement—the liver and spleen becoming diminished in bulk, and the blood resuming a more healthy character. But in a great majority of cases no such favourable result occurs, the patient, sooner or later, becomes steadily worse, and sinks, either from the renal disease, or from one of the many maladies which accompany it.

In many cases ascites or general dropsy gradually supervenes, while the urine diminishes in quantity, so as at times to be almost or altogether suppressed. It is very albuminous, but not of high specific gravity, and contains fatty and hyaline casts. Thereafter drowsiness may come on, and the disease may terminate amid coma and convulsions. In such cases, it is, however, as a rule, found that an inflammatory affection of the tubules has become super-added to the original degeneration of the vessels, and so the death cannot properly be referred to the waxy degeneration. But, in other instances, a fatal ter-

mination is due to chronic uræmia without dropsy, dependent simply upon the degeneration. But death oftenest results from the accompanying maladies, perhaps most frequently from diarrhœa, a result of waxy degeneration of the intestine; from phthisis, one of the most common causes of the lesion; from exhausting discharges connected with chronic abscesses, caries, or necrosis; or from constitutional syphilis.

The renal disease is thus met with in the post-mortem theatre in many different stages; for though not often itself the direct cause of death, those with which it is associated are so eminently fatal as to give the pathologist only too many opportunities of studying the disease in all its phases.

As examples of this form of the disease, we may take the following cases:—

Cases illustrative of the First Stage.

CASE XXIII.—*Waxy degeneration of kidneys, spleen, intestines, and liver; tubercle of lungs; lumbar abscess, &c.*—J. C., æt 14, a deformed boy, was admitted under my care to the Royal Infirmary in January 1866, on account of lumbar and psoas abscess, with tubercle of the lungs. He passed from seventy to one hundred or more ounces of urine daily. At first it contained no albumen; afterwards slight traces were found, although by no means constantly. In April he became affected with exhausting diarrhœa, at times dysenteric in its character; and in consequence of this, and the wasting discharge from the abscess, he died exhausted on May 7th. He never had a trace of dropsy.

Autopsy.—The body was much emaciated and deformed.

There was an opening in the abdominal parietes close to Poupart's ligament, and another in the lumbar region on the right side. The abscess was connected with caries of the bodies of several of the dorsal vertebræ. The lungs contained some obsolete tubercles. On the mitral valve there were some vegetations. The liver was large, fatty, and waxy. The spleen was bound down by numerous adhesions; its malpighian bodies and small arteries were waxy. In the former there were numerous extravasations of blood. The intestines were waxy. The kidneys were small—in some parts atrophied. In some of the tubules there was slight evidence of inflammation; in many there was a finely fatty condition of the cells; but there was no free exudation into the tubules, many of which were normal. The malpighian bodies and the arteries of the cortical substance, as well as the arteries of the cones, were waxy.

Commentary.—In this case we had the waxy degeneration originating in one of its most common causes—a wasting discharge from a carious bone—and manifesting itself (so far as the kidneys were concerned) by one symptom only, viz., the increased flow of urine; but so reliable do I consider the symptom when associated with any of the recognised causes of the waxy degeneration, that I ventured to anticipate, on his first admission to the hospital, the appearance of albuminuria—an anticipation which was not disappointed. The puckerings on the surface of the organs were, I think, results of slight local inflammatory action—too local to induce general symptoms.

CASE XXIV.—*Waxy degeneration of kidneys; tubercle of lungs and intestine; constitutional syphilis.*—J. M., æt. 24, a man of

syphilitic constitution, was admitted to the Royal Infirmary, under the care of Dr Scoresby Jackson, with symptoms of incipient phthisis, on March 8, 1865. His tubercular disease gradually became worse, and became associated with colliquative diarrhœa. He died exhausted July 7.

Autopsy.—The body was emaciated. The heart was thin and feeble, the valves were natural. Both lungs contained tubercular deposit, and were riddled with cavities. The liver weighed 4 lb. 6 oz., and was waxy and fatty. On its surface there was a number of small cicatrices and adhesions to neighbouring parts. The spleen was waxy. In the intestines, particularly in the sigmoid flexure of the colon, there were numerous tubercular ulcers. The kidneys were somewhat pale; they weighed together $10\frac{1}{2}$ oz. The vessels of the cones, and some of those of the cortical substance, were slightly waxy. The tubules were natural.

Commentary.—This case, occurring in a syphilitic individual affected with pulmonary and intestinal tubercle, proved fatal from those affections before the waxy disease of the kidneys was far advanced. I was unable to obtain any information as to the amount and quality of the urine, but it is probable that, from the severe diarrhœa, the quantity could not have been much increased.

CASE XXV.—*Waxy degeneration of kidneys; tubercle of lungs, &c.*—A. M. was under treatment in the Royal Infirmary, under the care of Prof. Laycock, for tubercle of the lungs. She died exhausted. On post-mortem examination the body generally was emaciated, and there was slight œdema of the labia. The heart was slightly dilated. The pleural surfaces were adherent, and the lungs contained much tubercle. The liver was enlarged and waxy; it weighed 5 lb. 7 oz. The spleen was waxy. The kidneys were of natural size; the tubules were natural, the vessels in a

state of waxy degeneration. The villi and vessels of the small intestine were waxy.

Commentary.—In this case also the renal symptoms were not recognised during life, attention having been mainly directed to the pulmonary affection.

Cases illustrative of the Second Stage.

CASE XXVI.—*Waxy degeneration of kidneys, liver and intestine, from caries; thrombosis of renal arteries; slight inflammation of tubules superadded; death from abscess in connection with caries of bones.*—Alexander Keay, æt. 19, waiter, single, born at Dundee, resident at the Granton Hotel, was admitted to Ward VIII, under my care, May 1, 1871, complaining of pain in the left hip, which he had felt for six days. The case was reported by Mr Pentland, clinical clerk.

History.—Patient had suffered from caries of the two last phalanges of the left great toe for a period of six years, during which it had kept on discharging a thin acrid fluid, until thirteen months ago, when he was admitted into the surgical wards, and the diseased portion was removed by Mr Annandale. The wound healed up very rapidly. Since then he has been in good health, and has never since, nor before, had any other illness.

He has always had good food and drink; but occasionally has drank to excess. His general surroundings have been good. The present illness commenced six days since with pain in the left hip, which, since then, has gradually increased in intensity.

State on admission.—Patient looks healthy, but is unable to walk, owing to the pain in the hip; configuration good; temperament sanguine; complexion ruddy; general appearance healthy; attitude natural when lying; temperature 101·3.

Alimentary system.—Lips and teeth normal; gums red, and bleed on the slightest touch; tongue dry, and coated with a yel-

lowish white fur ; secretions of mouth greatly diminished ; fauces natural ; deglutition natural ; appetite bad ; thirst very great ; has sensations of faintness and sickness when fasting, and a disagreeable taste in the mouth after food. He is troubled with constipation. Abdomen natural in appearance, and also on palpation. The superficial dullness of the liver is $4\frac{1}{2}$ inches in the mamillary line.

Circulatory system.—Pulse 88—weak but regular ; otherwise quite normal.

Urinary system.—There is no lumbar or vesical pain or uneasiness. Patient has passed 78 ounces of urine in the 24 hours. It is quite natural in appearance—its sp. gr. is 1016 ; reaction acid, and it is loaded with albumen.

Nervous and locomotory systems normal, except that the pain in the hip prevents him from sleeping much at night, and hinders him from walking. Other systems normal.

The provisional diagnosis was the waxy form of Bright's Disease, consequent upon disease of bone. The patient was ordered to have good diet, and to take 20 drops of the syrup of iodide of iron three times a-day. He was also allowed lime juice, as he complained so much of thirst.

May 4th.—Patient passed a very restless night. Temperature 99·4—pulse 88. Has passed 82 ounces of urine ; appetite a little improved ; ordered a subcutaneous injection of morphia.

May 5th.—Passed a better night ; pulse 86—weak ; temperature 100·1 ; urine 70 ounces—highly albuminous.

May 6th.—The pain in the hip was very severe last night, so the subcutaneous injection of morphia was repeated, and afforded much relief. Urine 50 oz.

May 19th.—Patient's condition has not much changed ; the pain in the hip and gluteal region on the left side still continues very severe, and the hypodermic injection is repeated every night. The amount of urine passes has been as follows :—

May 7th.—54 ounces.

May 10th.—66 ounces.

„ 8th.—60 „

„ 11th.—96 „

„ 9th.—56 „

„ 12th.—98 „

May 13th.—110 ounces.

May 17th.—96 ounces.

„ 14th.—80 „

„ 18th.—104 „

„ 15th.—80 „

„ 19th.—100 „

„ 16th.—126 „

May 20th.—To-day he has been troubled with diarrhœa, but he takes his food better. Urine 80 ounces.

May 21.—Urine 90 ounces. There is slight œdema of the legs.

May 22d.—Urine 70 ounces ; appetite improved ; thirst very great.

May 23d.—Urine 80 ounces.

May 24th.—To-day fluctuation was detected on the left gluteal region, apparently deep seated. An incision was therefore made, and about 3 or 4 ounces of pus escaped ; and on passing the finger into the opening the bone was felt to be carious. The œdema of the legs is increasing. Patient felt much relieved from pain after the operation ; the dropsy has increased ; ordered to-day—

R. Pulv. Scillæ gr. $\frac{1}{2}$.

Pulv. Digitalis gr. $\frac{1}{2}$.

Ext. Gentianæ q. s. ut ft. pil.

One to be taken three times a-day.

May 26th.—Patient has not suffered much pain since the operation, and the morphia injections have been discontinued. The diarrhœa still continues to be troublesome.

May 30th.—The diarrhœa still very bad. Ordered to-day the following :—

R. Argent. Nit. gr. iv.

Aquæ Distil. $\bar{\text{z}}$ iv.

Aquæ Bullientis $\bar{\text{z}}$ j. Fiat enema.

This enema was retained for an hour and a-half, and stopped the diarrhœa for the time.

May 31st.—Diarrhœa unimproved ; the enema to be repeated ; the urine passed has been as follows :—

May 24th.—90 ounces.

May 28th.—50 ounces.

„ 25th.—40 „

„ 29th.—40 „

„ 26th.—36 „

„ 30th.—30 „

„ 27th.—40 „

„ 31st.—36 „

June 1st.—The diarrhoea still continues; bed sores have formed over the sacrum and trochanters; ordered to be laid on a water mattress. The œdema of the legs is very considerable, especially about the ankles and knees. There is some redness and tenderness over the os calcis of the left foot; urine 56 ounces, very albuminous.

June 2d.—Urine 30 ounces.

June 3d.—Urine 36 ounces; pulse 112, and very weak; patient is evidently sinking.

June 4th.—The chest was examined to-day. The form and action was good; the vocal fremitus was increased on the right side anteriorly, but was equal on the lateral regions. On percussion, there was slight comparative dullness at the apex of the right lung, both anteriorly and posteriorly. On auscultation, on the right side anteriorly expiration was prolonged; the character of the breathing somewhat harsh; there were no accompaniments; and the vocal resonance was considerably increased, especially at the extreme apex. Auscultation yielded the same result posteriorly. On the left side anteriorly the breathing was slightly harsh; and posteriorly the vocal resonance was increased; otherwise normal. His cough is not troublesome; his pulse is 110, and scarcely perceptible; and his extremities are cold; he has only passed 20 ounces of urine during the twenty-four hours; œdema increasing.

June 5th.—Patient is much weaker. The swelling over the os calcis exhibited distinct fluctuation, and was accordingly opened this evening, and small quantity of pus escaped; urine 20 ounces; patient evidently sinking.

June 6th.—After the operation patient complained of violent pain in the knee, but this soon disappeared. He however rapidly sank, and died at 2 o'clock this morning.

Autopsy.—The body was thin but not emaciated; there were some old cicatrices over the left tarsus, and the bones of that foot were contracted by previous caries. The lower extremities were œdematous.

Thorax.—Lungs were bound by dense pleuritic adhesions to

the walls of the chest; they were congested and œdematous, especially at the posterior half; they contained a few old cheesy nodules at the apices.

Abdomen.—There were numerous old peritonitic adhesions. The omentum was bound to the intestines, and the folds of the intestines to each other.

The liver was firmly attached to the diaphragm, and was enlarged, weighing 5 lbs. 8 oz. On section, it was found to be markedly waxy, and also in some degree fatty.

The spleen was slightly enlarged, weighing 7 ounces; the malpighian corpuscles were rather more distinct than usual, and gave the waxy reaction with iodine.

The kidneys were enlarged, each weighing 10 ounces. On section, the cortical substance was found to be relatively increased; and the whole organ presented a pale greyish appearance, with something of the waxy translucency. Underneath the capsule the grey surface of the organ was mottled abundantly by small stellate vessels. On microscopical examination the tubules, especially in the cortical portion, were found to be occluded with exudation and altered epithelium, the cells being loaded to a great extent with fatty granules. In many of the tubules the epithelium remained intact, and showed no sign of inflammation. On the addition of iodine the malpighian bodies presented the characteristic straining of waxy degeneration in a very marked degree, as did also many of the smaller arteries. The mucous membrane of the pelvis of both kidneys contained some tubercular nodules. The stomach and intestines exhibited in a marked degree the waxy degeneration.

In the left iliac fossa, underneath the iliacus and psoas muscles, there was found a large abscess cavity capable of containing about half a pint of fluid,—it burrowed upwards under the psoas about as high as the 4th lumbar vertebra,—and downwards under the psoas and iliacus into the thigh, as low down as the small trochanter. Around the upper three inches of the sacro-iliac synchondrosis the contiguous margins of the sacrum and ilium were denuded of their periosteum, and in the synchondrosis itself at this part the

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inter-articular cartilage was completely destroyed, so that there was a gaping interval between the bones, about half an inch in width. The opposing surfaces when removed were found to present a rough worm-eaten carious appearance; there was no pus in this abscess cavity, the only fluid it contained was a few drachms of oily liquid, in which were numerous shining yellow particles, and these under the microscope were found to contain fat crystals.

Commentary.—When this patient was sent to the Infirmary it was not known that the kidneys were diseased. In the course of taking the report the clinical clerk discovered the albuminuria and the increased flow of urine. Taking these circumstances along with the long standing caries and the complete absence of dropsy, there was of course no difficulty in establishing a diagnosis of the waxy form of Bright's Disease. Some time after admission dropsy appeared, the quantity of urine diminishing simultaneously. This led to the diagnosis that some degree of inflammation of the tubules had been superadded to the primary lesion. From the presence on one or two occasions of tubercular-looking matter in the urine, taken along with the constitutional state, and the evidence of tubercle in the lungs, I was led to think it probable that tubercle might be present in the kidneys also. The post-mortem examination revealed all these conditions—the waxy degeneration extensive and general throughout the kidney; the inflammatory lesions, which were comparatively slight, and tubercular nodules in small quantity here and there in the pelvis. But there was one condition which had not been an-

ticipated, namely, the thrombosis of the renal arteries. This had doubtless much to do with the development of the symptoms of the inflammatory form. I have included this case among the purely waxy, as during a great part of its progress it belonged to that category. The only other symptom worthy of remark was the diarrhœa, which came on late in the case, and led to a diagnosis of waxy degeneration of the mucous membrane of the intestine, which the autopsy confirmed.

CASE XXVII.—*Waxy degeneration of kidneys ; diarrhœa, &c.*—A. C., æt. 30, was admitted to the Royal Infirmary, under the care of Dr Sanders, May 30, 1864. She stated that she had enjoyed good health until within four weeks of her admission, but for some months before she had observed that she passed a larger quantity of urine than natural. She was obliged to get up several times during the night. She had a little dropsy, but it disappeared on the occurrence of diarrhœa, a few weeks before admission. Her urine was pale, of sp. gr. 1010, contained much albumen, always exceeded 60 oz. daily, although she was affected at the same time with severe diarrhœa. She had frequent vomiting, and gradually became exhausted, and died June 28. Her family was strumous. There was no positive evidence of syphilis, but she had a cachectic appearance, and complained much of pain in her bones.

Autopsy.—The body was somewhat emaciated ; the heart and lungs were natural. The bronchi contained much muco-purulent fluid. The liver was large, weighed 4 lb. 6 oz., was bound to the diaphragm by numerous old adhesions ; it was fatty and waxy throughout ; both the cells and vessels were waxy. The spleen weighed 1 lb. 1 oz. ; was extremely waxy. Both kidneys were enlarged ; the left weighed $9\frac{1}{2}$ oz. ; the right $7\frac{1}{2}$ oz. The vessels

were extremely waxy, both in the cortical substance and in the cones. The tubules were in many parts distended with a clear hyaline material, and the epithelium finely granular. The basement membrane of the tubes also appeared in some parts waxy. The intestines were waxy.

Commentary.—This case proved fatal during the second stage of the disease, not from affection of the kidneys, but from the severe diarrhœa, which resulted from the disease of the intestines. The disease, which as we have seen is insidious in its progress, had come on at least six months before her death, but it is very probable that it had existed even before that time. Notwithstanding the severe diarrhœa, she passed an excessive quantity of urine during the time that she was under observation.

CASE XXVIII.—*Waxy degeneration of kidneys, fatal in second stage; struma.*—M. M., æt. 17, was admitted to the Royal Infirmary, March 3d, 1860, and was under the care of Drs Bennett and Laycock. She had suffered from carious disease of the vertebræ. During February she had noticed that she was making more water than usual. Her urine was always albuminous, ranged from 50 to 120 oz. daily, and deposited hyaline casts, which contained here and there a fatty cell. In May she had diarrhœa, and at the same time dropsy, when her urine diminished to 30 or 40 oz. daily. It contained more tube-casts, and in the casts there were more cells than formerly. She died in the beginning of June.

Autopsy.—The body was somewhat dropsical. The liver and spleen were waxy. The kidneys were large and pale, exhibiting the characters of the second stage of the waxy degeneration, with some degree of the inflammatory affection of the tubules. There was no ulceration of the intestines.

Commentary.—This was a typical case of the waxy disease, in respect both of previous history and of symptoms. The patient died four months after she had noticed the increased flow of urine, but it may have existed much longer. She did not come under observation until the albumen had appeared. Some degree of inflammation was superadded to the original malady, and induced the dropsy and diminution of the urine.

CASE XXIX.—Edward Burns, a labourer, æt. 30, married, resident in Edinburgh, was admitted to Paton's Ward, January 12, 1860. Patient states that he has had very little sickness, and, in particular, that he never had syphilis; but he confesses to having suffered from bubos, resulting from a strain; his prepuce is remarkably contracted, and his throat presents most syphilitic-looking ulcerations.

On admission, his throat was ulcerated, his voice was husky, and he had a harsh cough, with occasional muco-purulent expectoration. At the apex of the right lung there was harshness of respiration, but no increase of vocal resonance; cardiac sounds normal; pulse 80, small and feeble. Blood poor in corpuscles; the white relatively more numerous; the red pale and flabby, with a tendency to tail, and form into rows like a string of beads rather than a rouleau of coins. Tongue clean; appetite pretty good; bowels open. Hepatic dullness extends from the sixth rib to the umbilicus. The spleen is also considerably enlarged. The urine is highly albuminous, of low specific gravity, and contains a few hyaline tube-casts. Patient stated that he never observed anything particular about his urine; but on its being measured it was found to amount to upwards of 100 oz. daily. It was always of low specific gravity, and never contained a trace of sugar. There was no œdema of the legs, unless occasionally, when he had been

working hard, and then his ankles got swollen at night. He continued under treatment for about four months, during which his general health improved, and his liver diminished slightly in size. The amount of urine became somewhat lower, and his blood presented a more healthy appearance. He was dismissed, at his own request, on April 30th; and thereafter was able to work at his business for some time.

7th April 1861.—His general appearance is better than it was last year. He states that he is quite well, but that the daily amount of urine has not diminished. It is highly albuminous, of low specific gravity, and contains casts. His tongue is clean; his appetite good; his bowels are moved twice a-day. The liver is much enlarged, measures 8 inches vertically in the right mammillary line, and extends considerably across the epigastrium to the left side. The spleen is also enlarged. The blood contains an excess of white corpuscles. Expiration is harsh and prolonged at the apices of both lungs. The heart-sounds are altered in tone, but not of a blowing character.

13th August 1862.—The patient again presented himself, and the following notes were taken:—He is more emaciated. States that from increasing debility he has been unable to work for a month past. He still makes large quantities of urine, which is albuminous, but not so intensely as before. It deposits a sediment containing hyaline tube-casts, with oil-granules here and there arranged in groups, as if resulting from disintegration of cells. There has been no dropsy of late. The liver, though still enlarged, is decidedly diminished since last report. He complains much of his breathing.

22d September 1863.—He complains much of difficulty of breathing, and of cough and headache when he attempts to stoop; he has also dropsy; and from all these symptoms feels himself unable to follow his usual work. The amount of urine is still large. He is obliged to rise three or four times every night in order to micturate. The urine is albuminous, and contains casts. He entered the Infirmary, and under the care of Dr Sanders improved so as to be able to go out, and for a time pursue his usual employ-

ment; but in November he again presented himself, complaining of a further aggravation of his symptoms. He died exhausted soon after re-admission, in November 1863.

Autopsy.—The body was somewhat emaciated. The heart was enlarged; its left side was much hypertrophied. The aortic valves were competent; but at the base of one of the segments there was a calcareous mass. The aorta was highly atheromatous. The lungs were very œdematous; the bronchi were congested and full of mucus. The liver was about the natural size. On its surface was a number of nodules and cicatrices. At the bottom of some of the cicatrices nodules of a pale colour were visible. On section numerous nodules were found scattered throughout the organ; they were pale, dense, and had an appearance exactly resembling bees-wax; their structure was much denser than that of the surrounding tissue. In some nodules there were streaks of fibrous tissue throughout the substance and round the margin, and the greater the proportion of that tissue the deeper were the cicatrices. In the nodules elevated above the surface there were no such streaks, or very few. In those situated at the bottom of deep cicatrices the fibrous element was abundant, or even in excess of the glandular. On applying iodine to these masses, the whole of the waxy-looking material assumed the brownish red colour characteristic of the amyloid degeneration, but the fibrous streaks simply assumed a yellow tinge. Microscopically, the masses were found to present exactly the characters of ordinary amyloid hepatic cells. They were composed entirely of these cells, enlarged, transparent, and finely granular. In some parts the cellular elements were broken down, and a finely granular material, containing some oil globules, was present. The fibrous tissue in the masses presented the ordinary characters of connective tissue; and where it was most abundant the cells were most atrophied. Throughout the rest of the organ the cells were little affected with the waxy degeneration, but some of the small vessels showed it distinctly. The fibrous bands were seen passing into the tissues round the cicatrices and nodules. The capsule of Glisson was thickened in some parts, and on applying the iodine externally to

the cieatriecs no reaetion was observed. The spleen contained one eieatrized mass, whieh presented no reaetion with iodine. The kidneys were somewhat eontraeted in the eortial substance, and presented a very well-marked instance of the amyloid degeneration of the vessels and malpighian bodies. Some of the tubules contained hyaline material, whieh did not become eoloured with iodine. There was some degree of amyloid degeneration of the villi of the small intestine ; the bowels were otherwise natural. The prepuce presented traees of the old syphilis, and it had been previously ascertained that there were numerous syphilitic ulcerations in the throat.

Commentary.—This case was evidently of considerable standing. Notwithstanding his assertion, I was satisfied from the first that he had been the subject of syphilitic disease, and in the course of his illness he acknowledged the correctness of my opinion. The case affords an excellent example of the latency of the symptoms in many of these cases of waxy degeneration. The condition of the urine was eminently characteristic of the disease ; and but for the indications it afforded, it would have been impossible for us to have diagnosed the existence of the affection. There was no characteristic appearance of the countenance, no diarrhœa, no certain history of old-standing disease by which we could have been led to the opinion. It proved fatal after it had lasted upwards of three years, and the kidneys had begun to atrophy.

Cases illustrative of the Third Stage.

CASE XXX.—*Waxy degeneration of kidneys, fatal in third stage, &c.*—J. P., æt. 50, a quarryman, resident in Edinburgh, was admitted under my care May 12, 1865. He denied having had syphilis, and stated that he had been in general healthy. For some time before his admission he noticed that his feet became swollen at night, that he had frequently to get out of bed in order to make water, and that he had great thirst.

On admission.—His legs were œdematous; his complexion was good; the cardiac sounds were natural; the arteries atheromatous; there was a slight arcus senilis; the red corpuscles of his blood were flabby; he had some bronchitis; his appetite was impaired; his bowels acted naturally; his liver and spleen were of normal size; the urine averaged about 120 ounces, was pale, of sp. gr. 1008, distinctly albuminous; no casts were found. Under treatment he improved, and was dismissed June 5th.

On the 12th of that month he returned, feeling decidedly worse. He then had some muscular twitchings, without loss of consciousness. These were followed by a severe convulsion on the 14th, during which he became quite unconscious. In the afternoon he had another severe fit. He gradually became comatose, and died on the 22d.

Post-mortem examination, twenty-three hours after death.—The body was not dropsical nor much emaciated. The heart weighed 1 lb. 3 oz., and was dilated and hypertrophied. There was considerable atheroma of the arteries. The lungs were congested, œdematous and emphysematous; contained traces of old tuberculous or syphilitic deposit. The liver weighed 4 pounds. Many of its cells were fatty, and its smaller vessels were waxy. The spleen weighed 6 ounces; was not waxy. The kidneys were waxy. They were considerably reduced in size, the capsule stripped off without much difficulty, the surface was rough and granular. The malpighian bodies were closely aggregated, especially near the surface. The tubules were in that part atrophied, represented merely by

fibrous tissue. The vessels and villi of the intestine were waxy. In the white matter of the posterior lobe of the right hemisphere of the brain there was a recent clot of the size of a pea; the cerebral substance generally was congested and œdematous.

Commentary.—This case was also of considerable standing. The patient had evidently had syphilis. His case affords another example of the latency of the symptoms in the waxy degeneration. The condition of the urine was eminently characteristic; and but for the indications it afforded, we could not have diagnosed the existence of the affection, there being no characteristic appearance of the countenance, no enlargement of the liver, no diarrhœa, no certain history of old standing disease by which we could have been led to the opinion. The nervous symptoms which preceded death were probably due to cerebral congestion and apoplexy, rather than to blood poisoning.

CASE XXXI.—*Waxy degeneration of kidneys, fatal in third stage; syphilis; uræmia.*—J. N., æt. 37, a miller, was admitted to the Royal Infirmary, under my care, on May 13th, 1865.

Previous history.—Twelve years before admission he had contracted constitutional syphilis, and for eight years had been out of health. He suffered from various constitutional symptoms, and in 1862 he was obliged to rise frequently during the night to make water. The daily amount of urine passed was found at that time to be from 150 to 180 ounces.

His symptoms had gradually become worse; he had cough and some difficulty of breathing; and once, in March 1865, he had a fit, which lasted for three minutes, during which he was unconscious, and moved convulsively.

On admission.—The complexion was generally fair; the cheeks and nose were red, in consequence of dilatation of small vessels. The tongue was clean, the appetite good. The liver measured $6\frac{1}{2}$ inches vertically in the mammillary line. The heart sounds were natural. Some of the smaller vessels were atheromatous. The white corpuscles of the blood were somewhat increased in number, the red were soft and flabby. The nervous system was natural. The amount of urine ranged from 90 to 150 oz. daily; it was pale, of sp. gr. 1010, albuminous, and contained some hyaline and granular casts. By careful measurement it was ascertained that the amount of fluid consumed daily was less than the urine passed.

Early in June he became affected with diarrhoea; he also became peculiarly irritable, had distressing dreams, and fancied he saw black objects, particularly a large black rat, flitting about the ward. He also complained of pain in the left forehead. He gradually became exhausted and more delirious; there was a good deal of twitching of the muscles, but no convulsion. He died June 14th.

Post-mortem examination, twenty-six hours after death.—The body was not dropsical or emaciated. The pericardium contained a little fluid. The substance of the heart was pale and fatty. The valves were competent, but there was some deposit at the bases of several of the segments. The bronchi were congested, and contained a good deal of mucus. Both lungs contained syphilitic deposits, partially softened. The liver weighed 7 lb. 11 oz. It was connected by adhesions with neighbouring organs. It also contained some syphilitic and waxy masses, which evidently bore a relation to the cicatrices. Many of the small vessels were waxy; many of the cells were waxy and many fatty. The spleen was much enlarged, waxy, weighed 3 lb. 3 oz., it contained peculiar cicatrices and deposits of altered blood. The suprarenal bodies were waxy. The kidneys were large, their surface granular, the increase of bulk being from syphilitic desposits. The vessels of the cortical and conical parts were extremely waxy. Some of the tubules contained fatty matter. The right testicle contained a syphilitic

deposit. The intestine was waxy, and was ulcerated at one or two points. The brain was congested and œdematous, contained no syphilitic deposit, and its vessels were not found to be altered. The cord was in the same condition as the brain.

Commentary.—This was a typical case following upon syphilis. The increased flow of urine had been observed for three years, and all the symptoms of the disease were well marked. The peculiar variety of uræmia which preceded death was also very interesting.

CASE XXXII.—E. H., a washerwoman, æt 43.—She had been of intemperate habits, but was not known to have had syphilis; she had long-continued polyuria; her urine was of low specific gravity, very albuminous, and contained hyaline casts. She had also a lesion of the aortic and mitral valves. She was dismissed from the Royal Infirmary in May 1860. In November of that year I found that her symptoms were not materially changed. She continued to make from 180 to 210 oz. of urine daily. It was of low specific gravity; it contained albumen and casts. There was slight œdema; the diarrhœa less intense than formerly; the cardiac symptoms unchanged. Throughout the years 1861–62–63 I saw her frequently in St Cuthbert's Poorhouse, in the Royal Infirmary, in the Dispensary, and elsewhere. The renal symptoms were little altered. A distinct aneurismal dilatation had gradually developed itself; and a certain amount of œdema of the limbs occasionally appeared. When she was last in the Infirmary I had the opportunity, by the kindness of Dr Laycock, of making the following notes:—

20th April 1864.—The skin is pale; conjunctiva clear, slightly œdematous. There is a good deal of congestion over the malar bones. The legs are œdematous; the tongue is clean. She has some difficulty in swallowing, particularly solids. Sickness, and now

and then vomiting, follow eating. Vertical hepatic dullness in the right mammillary line measures about 5 inches. The bowels are loose. She complains of pain in the left hypochondrium. She has occasional giddiness, and sleeps badly. Her pupils are equal. There is a double blowing murmur at the apex of the heart, and at the base of the neck there is a very distinct aneurism. The urine is copious, exceeding on an average 100 oz. daily. Its specific gravity is about 1008. It is of an acid reaction, contains much albumen with some phosphates, and epithelial and granular casts. Her dyspnoea, dropsy, and general debility gradually increased, until the 5th of June 1864, when she died.

Autopsy, fifty-eight hours after death.—The body was well nourished. The right pleural cavity contained about half an ounce of clear serum. The left pleura was obliterated by old adhesions. Both lungs were congested and œdematous; in several parts there were small dense nodules, whose nature was not determined. The pericardium contained a little fluid, and some lymph was deposited on both its layers. The heart was enlarged, weighed $8\frac{3}{4}$ ounces; it was fatty. The margins of the mitral valve were thickened. The aortic valves incompetent. The aorta was dilated, its coats sclerosed and atheromatous, and contained some calcareous plates. There were distinct dilatations in the course of the innominate and subclavian arteries. The liver weighed 3 lbs. $3\frac{1}{2}$ ounces, was soft and fatty, and presented no reaction with iodine. The spleen weighed $3\frac{3}{4}$ ounces, and was not waxy. The right kidney was small, weighing four ounces; the capsule was adherent; the surface granular; the cortical substance was atrophied. The left weighed 6 ounces, was distinctly waxy and fatty, less atrophied; the capsule was also adherent. The malpighian bodies, as well as the arteries of the cortex and of the cones, were in a state of waxy degeneration.

Commentary.—In this case there was no history of syphilis, nor of any other exhausting disease. The symptoms which led me to diagnose waxy disease

were the polyuria, the albuminuria, the diarrhœa, and the absence of dropsy. Before death there was considerable dropsy, which depended partly on the cardiac and vascular lesions,—partly on the superadded inflammation of the tubules.

CASE XXXIII.—*Waxy degeneration of kidneys, under observation for nine years; neuro-retinitis; uræmia, &c.*—Archibald March, æt. 29, a shoemaker, married, resident in Edinburgh, was admitted to Paton's Ward, February 15th, 1860.

In April 1859 patient was in the Infirmary on account of enlargement of the liver and spleen, with slight leucoeythæmia. He was dismissed considerably relieved; but having felt of late great oppression on taking food, with occasional bloody vomitings and increasing general debility, he was re-admitted. He states that some years since he had syphilis, which was followed by eruptions, nodes, &c., and ultimately by the symptoms of which he now complains.

Symptoms on admission.—His general appearance is cachectic and sallow; his chest covered with brownish patches of pityriasis nigra, which have existed for some years. There is no œdema. Pulse is full, 82 per minute. Cardiac dullness $2\frac{1}{2}$ inches transversely. There is a soft blowing murmur with the first sound, loudest at the base. There is a slight relative increase of the colourless corpuscles of the blood, and the red corpuscles have a tendency to tail. Tongue is moist; appetite not good; thirst great. He vomits occasionally after eating. Bowels constipated. The liver measures 9 inches in a line vertical to the nipple; and there is great tenderness on pressure over the whole area of dullness. The splenic dullness, laterally, is $5\frac{1}{2}$ inches from above downwards. The urine is of a pale amber colour; specific gravity 1009; contains no albumen. Such was his state on admission. He remained for some time under observation; and on March 3d it was ascertained that his urine amounted to 110 ounces daily,

and it continued at a similarly high standard, sometimes falling as low as 90 and rising as high as 130 ounces. Finding the amount of urine so large, and the general symptoms so closely resembling those I had observed in another case, I ventured to anticipate the appearance of albumen in the urine. It was carefully tested day by day, and about the 10th of March a trace of albumen was observable. It steadily increased in amount; and, soon after its appearance, a very few waxy or hyaline casts were to be detected by the microscope. Notwithstanding the increased flow of albumen, the patient, under a tonic treatment, with liberal diet, so far improved as to be able to leave the hospital, to resume work on March 26th.

December 3.—His complexion is sallow and cachectic as before; abdomen free from tenderness; liver measures, in line of right nipple, $7\frac{1}{2}$ inches, and the spleen barely 5 inches at the side. He does not know exactly how much water he makes daily, but thinks it is less than when he was in the Infirmary. It is distinctly albuminous. No dropsy. The glands of the neck on both sides have become enlarged within the last ten days. The blood is in the same condition as formerly. Thus it is evident that, except in regard to the kidneys, considerable improvement had taken place.

4th February 1861.—The liver and spleen have further diminished in size. His appearance is somewhat less cachectic. For some days he has had a pain in the neighbourhood of the umbilicus, and along the margin of the liver, aggravated on movement or on pressure, and after eating. The stools are of a dark colour, and contain some bright red blood. He has no piles. The amount of urine continues high, about 120 ounces daily—it is albuminous.

8th October 1861.—The patient again presented himself; his cachectic appearance is increased; he complains of a severe pain in the lumbar region, and along the spermatic cords. His renal symptoms continue unchanged, and the liver is still distinctly enlarged.

1st June 1864.—Since the last note he has frequently presented himself at the New Town Dispensary and elsewhere; has repeatedly been an inmate of the Royal Infirmary; has been able

occasionally to work at his occupation of shoemaking, and has of late acted pretty constantly as cook to the Midlothian Militia, stationed at Dalkeith.

The following note was taken on the 21st March 1864:—He continues to make large quantities of water daily, usually upwards of 120 ounces. It is still albuminous, but no tube-casts have been discovered for some time. The hepatic dullness is diminished to about six inches; the organ is still painful on pressure. He has no nausea, and his bowels are regular; but on several occasions lately he has had intense diarrhoea, sometimes bloody, and has vomited blood-coloured matters. His complexion is even darker than before, and his eyelids are more cedematous than I have ever observed them. From some observations made for me by Mr Taylor, it appears that his temperature is somewhat lower than natural.

He has since that time been frequently under my care in the Infirmary. The following reports describe his condition when last seen:—

17th March 1868.—Again presented himself, complaining of gastric symptoms, which he ascribes to an afternoon's indulgence in whisky. Complexion much less sallow, lips have more colour, tongue somewhat furred, no tenderness on pressure of abdomen, liver measures $5\frac{1}{2}$ inches, splenic dullness 3 inches, cardiac sounds natural, bowels natural. Thinks he makes about 100 ounces of urine daily. Sp. gr. 1006. Reaction feebly acid. It contains a considerable amount of albumen, about one-fourth. Tube-casts scanty, large and hyaline. Blood presented a slight excess of colourless corpuscles. Patient has been working steadily for five months.

30th March 1868.—Feels much better. Quantity of urine as usual; albumen is still considerable, about one-fourth.

14th January 1871.—Since last report the patient has frequently come as an out-patient, and has on the whole been pretty well. To-day he applied for re-admission, complaining of partial loss of sight, particularly of the left eye, and of pain over the region of the spleen. He has been ill for a fortnight. The case is recorded by Mr Underhill, clinical clerk.

History.—His general surroundings, and his habits as to food

and drink, have been good. The present illness commenced about New Year's day, with palpitation, and some difficulty of breathing, together with a dull heavy pain in the left side. He first noticed the indistinctness of vision two days before admission. His face presents a pallid pasty look, having the appearance of that of a man who has suffered from some wasting disease.

Alimentary system.—Tongue pale and moist; appetite fair; has considerable thirst, and a tendency to habitual constipation; otherwise the system is normal.

Circulatory system.—Normal. Does not now feel the palpitation that he complained of at the beginning of the illness. Pulse 90, tolerably full and strong.

Blood system.—Some of the red corpuscles were somewhat crenated, there was no increase of white corpuscles, nor did the red show any tendency to tail.

Respiratory system.—Normal, except that he has a little cough, and expectorates a small amount of mucus tinged with black particles.

Integumentary system.—Normal.

Urinary system.—There is no vesical pain or uneasiness. The amount of urine passed during the 24 hours is 120 ounces, and he has to get up two or three times during the night to micturate. It is pale coloured. Sp. gr. 1010. Reaction acid, and there is a considerable amount of albumen present. No deposit.

Nervous system.—Normal, except the indistinctness of vision, which consists of a general haziness, and the straight outlines of objects appearing to be crooked. He sometimes has cramps in the legs, and also headache and giddiness. He was ordered a teaspoonful of the Compound Syrup of the Phosphates, thrice daily.

Jan. 16.—Passed 110 ounces of urine during the 24 hours. Complains of some shortness of breath.

Jan. 17.—He slept well last night. His face is a little swelled and puffy. He states that his ankles were swelled last night, but nothing of this is now to be seen. Ordered to-day a teaspoonful of the syrup of iron, quinine, and strychnine, three times a-day. He is also to take half an ounce of the following mixture thrice daily :—

R. Potass. Iodid., $\mathfrak{z}\text{i}$.

Inf. Quassiae, $\mathfrak{z}\text{vi}$.

Misce.

Jan. 18.—Urine 98 ounces. Patient says he feels better. The face does not seem so puffy, and there is no trace of œdema in the feet or legs. The amount of albumen is less. He can also see a little better. His eyes were examined to-day ophthalmoscopically by Dr Argyll Robertson, who reported that there were one or two small points of extravasation of blood into the retina, near the entrance of the optic nerve, and also several spots of exudative material. He was ordered to-day a drachm of compound jalap powder.

Jan. 19.—Does not feel any headache or giddiness to-day, but still has slight muscular twitchings. He vomited some bloody matter last night, and says he passed blood in his stool. The pulse is pretty full, 93 per minute. He sleeps well, but does not feel refreshed by it. His eyesight is worse to-day. Complains of a sore throat. The powder acted well. The amount of urine not ascertained.

Jan. 20.—He has passed 105 ounces of urine in the 24 hours. He vomited again last night, but no blood was seen. He slept but little last night, and has a bad headache to-day. Face somewhat swelled, but there is no swelling elsewhere. Ordered sinapisms to the neck and epigastrium.

Jan. 21.—Patient slept well and has not vomited since. The face is a good deal swelled. The amount of urine could not be ascertained. Throat still sore, being very congested.

Jan. 22.—The face is still more swelled. Urine 100 ounces. Tongue furred; vomited twice last night. Pulse 104. Ordered poultices to the throat.

Jan. 24.—The face is less swelled; sp. gr. of urine 1010; acid in reaction. The amount of albumen continues to be diminished. Pulse 108, moderately full. Throat better. He complains of a good deal of heat in his face and feet, and of cold elsewhere. Ordered hot-air bath, and also to drink warm water.

Jan. 25.—The hot-air bath relieved him, but did not produce

any perspiration. To repeat the bath, and have a mustard blister over the chest. Urine 110 ounces; pulse 92.

Jan. 26.—The headache and giddiness gone; no vomiting. To repeat the bath. The temperature is normal.

Jan. 27.—Face less swelled. Urine 72 ounces. Vomited again to-day; coughs and spits a good deal. The bath has not produced any sweating. It is to be repeated.

Jan. 28.—Vomited last night. Complains of headache and giddiness to-day. Urine 72 ounces; pulse 100, soft and compressible.

Jan. 29.—Vomited again this morning; no appetite. The urine amounts to 70 ounces, and contains no albumen. Face more swelled, but he sees better.

Jan. 31.—Face very much swelled, especially the eyelids. Urine much diminished in quantity, but exact amount not known. Pulse 99, weak. Patient is in a drowsy and stupid condition to-day. A blister was applied to the back of the neck.

Feb. 1.—At visit to-day patient was in a very drowsy and torpid state, but when aroused was conscious; he occasionally wandered and moaned. Ordered an injection of castor oil. There is no swelling of the feet, legs, or abdomen, but he has passed very little water.

Feb. 2.—Patient is worse to-day; and at visit he was lying in a drowsy condition, occasionally grinding his teeth, and speaking indistinctly; but he answered promptly when addressed, and wished to have his water drawn off, although the bladder was emptied two hours before. He frequently yawns. The eyes are closed by œdema, and the tongue is swelled, and he seems to swallow with difficulty. His pulse is 120, and full. On the left side of the chest posteriorly there is comparative dullness; ordered to have a sinapism over the seat of dullness.

Feb. 3.—Patient is much worse this morning. He is lying in a perfectly insensible condition; his breathing is short and gasping; his forehead is covered with a cold clammy sweat. He passed a very restless night. The urine is pale coloured, and slightly acid; its sp. gr. 1015; and it is highly albuminous. The pulse is very weak, and he is evidently sinking.

Patient died between 5 and 6 this evening.

Post-mortem examination.—The kidneys were atrophied, and each weighed $2\frac{1}{2}$ ounces. The capsule was thickened, and at some parts adherent, but generally readily separable. The surface of both organs was granular, with alternate elevations and depressions, and its colour was reddish. On section, the cortical part was relatively diminished, and the malpighian bodies were distinctly waxy. On microscopical examination, the atrophy was very distinct towards the surface, and the malpighian bodies, and many of the small arteries, were waxy, and presented the ipecacuan-root appearance. Many of the latter were also distinctly enlarged. In some of the tubules there was a dark fatty material, but the quantity was not great, and the number of the tubules affected limited. None of the tubules nor their contents gave the waxy reaction on the application of iodine. The stroma of the organ appeared to be increased in consequence of the atrophy of the tubules.

The liver weighed $3\frac{1}{2}$ pounds; was slightly below the natural size. It was in many parts adherent to the diaphragm, and its surface was studded with syphilitic cicatrices, which were more numerous in the left than in the right lobe. At several points of the surface there projected rounded knobs of a whitish-yellow matter, varying in size from a pea to a walnut. On section, the liver appeared of natural toughness, and to the naked eye not markedly waxy, but the small vessels here and there showed a distinct reaction with iodine. The cicatrices presented no special relation to the masses, and existed in the substance of the organ as well as on its surface, though in less number. On microscopical examination of the least affected parts of the liver, there were found in some places fatty cells irregularly distributed; in others waxy cells; the latter condition not very generally diffused, but here and there, as was seen by the naked eye, the vessels presented well-marked waxy reaction. At the base of the cicatrices, connective tissue with well-marked waxy vessels (some having the ipecacuan-root appearance), together with atrophy of gland elements, is seen. The whitish-yellow masses were found to consist of patches of tissue, in which the glandular and vascular

elements had undergone complete waxy degeneration; and here and there in the substances of the masses there were strands of fibrous tissue not reacting with iodine.

The spleen was enlarged; weight not ascertained. Its fibrous stroma was increased; its substance dense; and the pulpy juice not capable of being readily squeezed out. On microscopical examination, the malpighian corpuscles were nowhere distinct, but the arteries were distinct, and presented the appearance characteristic of the waxy degeneration.

The stomach was of natural size, and the mucous membrane nowhere ulcerated; gastric tubules natural. Its vessels were waxy. The mucous membrane of the intestines was also waxy.

Commentary.—I watched this case carefully for about ten years. I was led to anticipate the appearance of albumen in the urine by the history of syphilis, the enlargement of the liver and spleen, the altered state of the blood and the polyuria. From day to day I watched, and found after a time a slight trace, which, with occasional intermissions, became gradually more distinct; and when once fairly established never disappeared till his death. The excessive flow of urine continued throughout all these years. Marked improvement took place in the state of his blood; for while the white corpuscles were at first increased, and the red showed a distinct tendency to tail rather than form into rouleaux, in the end both sets of corpuscles were normal in relative number and appearance. Great improvement also took place in the liver; for that organ, which at one time reached below the umbilicus, was afterwards nearly restored to its normal size. His general con-

dition also improved materially; but unfortunately there was no improvement in the general symptoms. When he came to the Infirmary seeking admission for the last time, I remarked that a fatal result was probably not distant. This prognosis was formed mainly on account of the eye symptoms, and was confirmed soon afterwards by the development of a listlessness of manner and alteration of the voice which I have often seen usher in chronic uræmia. The occurrence of dropsy of the face and of peculiar sore throat, with the gradually deepening uræmia, confirmed the accuracy of the prognosis. The kidneys presented exactly the characters which I had anticipated. The disease had gone on so long that we were bound to expect to find the atrophy well advanced. The condition of the liver also interested me much, as I believe that it had to a great extent recovered from degeneration, which was at one time general, and because it presented a rare pathological lesion, viz., waxy nodules throughout its substance, which I had described from another case (see Case XXIX), in 1864. The stomach and intestine, though in an advanced stage of degeneration, were not ulcerated. The patient had at one time suffered considerably from vomiting of blood, as well as its discharge from the bowels. Both symptoms I referred to the waxy degeneration, and so far as could be traced there was no appearance of ulceration having existed. The peculiar form of uræmia; and the affection of the retina, were also interesting.

This is the only case of simple waxy degeneration in which I have seen the characteristic neuro-retinitis. The case is, as a whole, worthy of special attention, having been carefully observed for ten years, from the commencement of the renal symptoms until death.

In many cases a peculiar cachexia exists, the characteristics of which are apparent at all stages of the disease. There is a pale anæmic appearance, with occasionally a little dark pigmentary matter in the skin, particularly about the eyelids, an air of general debility, and a pasty or waxy complexion. This would seem to be most commonly associated with the syphilitic form. In other cases there is a characteristic appearance of the face, with which I have become familiar, when the surface generally is pale and clear, but a very distinct congestion exists over the cheeks. This is not a congestion like a blush, but is seen by the naked eye to depend upon the distension of small vessels quite above the size of capillaries.

The characters, then, upon which we mainly depend for diagnosis are the increased flow of urine, commencing early in the history of the case, the albuminuria, the absence of dropsy, the previous history, the complications, and the appearance of the patient.

CHAPTER X.

THE WAXY OR AMYLOID FORM.

NATURE OF THE SYMPTOMS.

THE symptoms of the Waxy Kidney which specially deserve attention are those connected with the Urine, the Dropsy, and the Affections of the Nervous System.

1. The *urine* is, as a rule, increased in quantity. It ranges from 60 to upwards of 200 oz. daily.¹ Of all the cases which I have observed in the Royal Infirmary and elsewhere, in none was this symptom absent, excepting when severe diarrhoea, or inflammation, or other disease of the kidney, co-existed with the malady. Along with the polyuria there is increased thirst, but careful measurements in many cases have shown that the fluid passed is equal to or in excess of the total amount consumed.

This symptom appears to be referable to the degenerated state of the vessels. It may be that the degeneration of the muscular fibres of the small arteries leads to paralysis and dilatation of these

¹ Rosenstein contradicts my statement that the urine is always above the natural amount in this disease ; his mistake arises from his failing to distinguish between simple waxy and the combined waxy and inflammatory diseases. I was much interested to observe, while these sheets were in the press, that Dr Harris of London had recognised the existence of polyuria in this disease in 1860.

vessels, but certainly we are entitled to assume that the degenerated walls, although thickened, permit undue transudation of their contents. In the intestine we find this degeneration accompanied by a corresponding symptom—diarrhœa, often profuse and watery. To this increased permeability of the vascular walls, then, the symptom may be best referred. It has indeed been suggested that the increased flow may be due to increased blood pressure on the unaffected vessels, a consequence of obstruction of the circulation in those which are degenerated ; but this, though it might account for the urine being little diminished, seems incapable of explaining an increase. Besides, polyuria may co-exist with very general degeneration of the vessels, and it is always an early symptom.

Is this polyuria to be regarded as an unfailing evidence of the waxy degeneration ? Certainly not : for, apart from diabetes mellitus, we observe the same symptom in diabetes insipidus, in many nervous diseases, and sometimes in advanced stages of the inflammatory and in the cirrhotic forms of Bright's Disease, as well as in cases of irritation of the kidney from renal calculus.

Is it always present in the waxy degeneration ? I have never found it absent, except in cases accompanied by severe diarrhœa, or by inflammation of the tubules of the kidneys, or by a peculiar syphilitic deposit in the stroma of the organ, or by thrombosis of the renal arteries.

In *colour* the urine is generally pale, from the large proportion of water it contains. Its specific gravity is for the same reason low, from 1005 to 1015.

With regard to the natural solid constituents, we are indebted to Rosenstein and Dickinson for a number of careful analyses. They found that throughout the greater part of the duration of the disease the urea falls little, if at all, below the natural amount. But it is obvious that in advanced stages, when many of the uriniferous tubules are occluded or atrophied, the quantity must be somewhat diminished. The amount of uric acid varies in different instances. The phosphoric acid is diminished, Dr Dickinson says, more constantly in this than in either of the other forms. Sulphuric acid, chlorine, and alkaline and earthy salts are also diminished.

Albumen is the most important abnormal constituent. The cause of its occurrence here is most probably the increased permeability of the walls of the vessels. At first the degenerated structures permit merely of an increased transudation of water, but as the disease advances albumen also escapes, at first in very small quantities, afterwards in greater amount, sometimes, when it has been solidified, equalling in bulk one-fourth, or even one-half, the urine. Blood sometimes also escapes from rupture of the capillaries, but this is comparatively rare.

Tube-casts are, as a rule, not very numerous in this disease, but may generally be discovered by careful examination. They are for the most part

hyaline and finely granular; sometimes they contain fatty cells. I have never seen the casts present the peculiar re-action with iodine, although I have occasionally seen appearances somewhat like it. The formation of the casts depends upon transudation of fibrine through the degenerated walls of the vessels, and its coagulation or formation within the tubules.

2. *Dropsy* does not, as a rule, occur in this disease in its early stages, and often it does not appear even when the malady is far advanced. In a series of fifty cases which I examined post-mortem it was present only in three, that is in 6 per cent.; while in a series of cases of combined waxy and inflammatory it occurred in 47 per cent. But in a certain proportion of cases it does appear, and then, if not dependent upon complications, it may be referred to the anæmic condition which the disease, if long continued, induces.

3. *Nervous Symptoms* are not so frequent in this as in the other forms of renal disease. They occur only in the advanced stages, and in the cases in which inflammatory disease of the tubules has been superadded.

The character of these symptoms is also at times peculiar, as was seen in the case of J. N., p. 148, and A. M., p. 152. The theories of Uræmia having been sufficiently explained in a previous chapter, need not be considered here.

CHAPTER XI.

THE WAXY OR AMYLOID FORM.

COMPLICATIONS AND CAUSES.

IN considering such a disease as the Waxy Degeneration of the kidneys, it is convenient to group together the Causes and the Complications, as, from the chronic character of the disease and its causes, they are apt to co-exist.

We shall take up, 1st, The Causal; 2d, The Concomitant; and 3d, The Consequent Complications.

(a) Causal Complications.

1st, Tuberculosis¹ of Lungs and other organs.—Tubercle of the lungs existed in about one-half of all the cases of waxy kidney which I have examined post mortem in the Infirmary; tubercle of the intestine in about 18 per cent. In a very considerable proportion of these cases it appeared that tuberculosis was a cause of the renal disease. When we analyse the relationship more closely, we find that tubercle of the

¹ The term Tuberculosis is employed in the old sense, as including all the forms of Phthisis, not in the more accurate sense now generally recognised.

lungs was specially associated with the earlier stages; for of those fatal in the first stage it was present in 66 per cent.; of those in the second in 60 per cent.; and of those in the third in 35 per cent. When we compare this with what we find in other forms of renal disease, the relationship between tubercle and the waxy degeneration becomes manifest, for with the inflammatory it was present only in 7 per cent., with the contracting in 23 per cent.

2d, Syphilis.—This disease is universally recognised as a cause of waxy degeneration. In a very considerable proportion of the cases which I have observed during life, or examined after death, it unquestionably existed; in many of those which were complicated with tuberculosis it was present, but obvious grounds of uncertainty have prevented the accurate tabulation of the facts. From my notes, however, it appears that more than half of all my cases observed during life were so complicated.

3d, Caries and Necrosis.—These affections of bone have also long been recognised as causes of waxy degeneration, but they are much rarer causes than those already mentioned. Among my cases it appears that from 10 to 15 per cent. may be reckoned as belonging to the group.

4th, Chronic Suppuration is believed by some to be the most important causal complication. It, of course, exists in all the cases of advanced tuberculosis, and of caries and necrosis. I have not seen suppuration, independent of them, lead to the disease, and in

a considerable proportion of my cases it assuredly did not exist.

5th, Cancer is an occasional causal complication.

6th, Chronic Rheumatism is another disease which is occasionally known to precede, and perhaps to cause the renal affection.

Rosenstein² has collected from various sources a series of 100 cases, among which the following were stated to be the causes:—

Tuberculosis pulmonum,	.	.	44
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(Of these, ten cases were also affected
with ostitis, and one with syphilis.)

Suppuration of bone,	.	.	29
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Syphilis,	.	.	15
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Empyæma,	.	.	3
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Carcinoma,	.	.	3
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Psoas abscess,	.	.	2
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Pyelitis and hydronephrosis,	.	.	2
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Abscess of liver,	.	.	1
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Chronic alcoholism,	.	.	1
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Of 20 cases recorded by the author³ in 1861—

6 had Phthisis.

6 ... Syphilis.

2 ... Caries.

2 ... General debility.

1 ... Cancer.

1 ... Chronic rheumatism.

² Op. cit., s. 256.

³ Edinburgh Medical Journal, February 1861.

My friend and former assistant, Dr Roberts Thomson⁴ of Bournemouth, published an account of the causal complications which were found in a series of 50 cases examined post mortem in the Royal Infirmary, Edinburgh. He found that—

Syphilis was noted in 12 cases,
of which two were doubtful.

Tubercle, . . . 13 cases.

Diseased bone, . . . 1 case.

Thus the causal complication was recorded in only one-half of the cases, but of those which were recorded the proportion corresponded closely with my results.

(b) *Concomitant Complications.*

The concomitant complications of waxy Bright's Disease are similar degenerations of other organs, and their consequences.

1st, Waxy degeneration of the Liver co-existed with the waxy kidney in about 70 or 80 per cent. of all my Infirmary cases, and was never found in combination with the other forms of renal disease. It is often combined with fatty degeneration, and occurs in three forms—a diffused affection of the cells of the organ; an affection of the small vessels; and, rarely, in nodules here and there affecting all the elements. These conditions do not, so far as I am aware, lead

⁴ Glasgow Medical Journal, 1866.

to any important symptom, excepting the enlargement of the liver, which accompanies them.

2d, Waxy degeneration of the Spleen.—The spleen was waxy in fully 80 per cent. of my cases—the degeneration sometimes affecting the malpighian bodies and small vessels only, constituting the sago spleen, sometimes also affecting the pulp, leading to a general induration of the organ. In both of these forms the spleen is, as a rule, enlarged, and very commonly the blood shows, under the microscope, a morbid appearance. The number of the white corpuscles is increased, while the red are flabby, and have little tendency to form rouleaux, and, on the other hand, neighbouring corpuscles adhere to one another, and assume oval or pyriform shapes. I have found this condition in a large proportion of the cases examined during life.

3d, Waxy degeneration of the Alimentary Tract.—This degeneration affects the stomach and intestines, and has generally the small vessels as its chief seat, although it is not confined to them, for it occurs in the epithelial elements also. This complication was present in upwards of 50 per cent. of my cases examined post-mortem. Very often during life symptoms referable to it occur. The degeneration of the stomach is accompanied by dyspepsia and occasional vomiting. The vomited matter is sometimes watery, sometimes bloody.⁵

⁵ See British and Foreign Med. Chir. Review, Jan. 1868, p. 201.

The most prominent symptom of the degeneration of the intestinal mucous membrane is diarrhoea, which also is sometimes watery, sometimes bloody. But these symptoms are not constant, and I have seen some cases in which well marked degeneration existed without any diarrhoea.

(c) *Consequent Complications.*

The consequent complications of the waxy kidney are not very important, but they essentially correspond with those of the other forms.

1st, Affections of the Lungs and Bronchi.—Congestion and oedema of these organs existed in 20 per cent. of my cases,—a considerably smaller proportion than was found with the other renal diseases. Pneumonia also was rare, occurring only in 4 per cent. Moreover, it was specially frequent in cases fatal in the first stage. It seems to me that the co-existence was accidental.

2d, Hypertrophy of the Heart is a comparatively rare result of this disease. I found it only in 4 per cent. of my post-mortem cases, but all of these in which it occurred were cases in the third stage. It therefore appears to be a true consequence of the disease. Its occurrence is to be explained in the same way as in the inflammatory cases.

3d, Inflammation of Serous Membranes appears to be a rare complication of the disease. Pleurisy was present in 2 per cent.; pericarditis in 8 per cent.;

and peritonitis in 2 per cent. of my cases. The pericarditis, in particular, occurred more frequently in the advanced stages.

4th, Diseases of the Nervous System.—Serous apoplexy we pass over for the reasons previously mentioned. Sanguineous apoplexy occurred in 2 per cent. of my fatal cases, and these cases were in the third stage of the disease.

5th, Affections of the Lungs.—I have only once met with albuminuric retinitis in a waxy case, and in that case it only appeared when the disease had existed nearly ten years. Even then the symptoms were slight, and the anatomical changes not very widely diffused.

6th, Morbid Conditions of the Blood.—In the course of this disease the blood becomes deteriorated, as is shown by the pallor which so generally attends upon its later stages. It appears to me that in three of the cases recorded by Dr Christison, and in which he analysed the blood, the waxy degeneration was the form of renal malady from which the patient suffered, although a certain amount of inflammation was superadded in more than one.

Case XIV⁶ was that of a medical practitioner in the north of Scotland, who died of intercurrent pleurisy. Some blood was drawn and examined. It presented a strong buffy coat, a scanty contracted crassamentum, and a very abundant slightly lactescent

⁶ Op. Cit., p. 227.

serum. The serum had a density of 1018·5, and contained only 6·16 per cent. of solids. In 10,000 parts of blood there were only 491 parts of hæmatosin, 583 of solids of the serum, and 56 of fibrine. 500 grains of serum evaporated to dryness gave a fluid which yielded an abundance of pale pearly scales with nitric acid. In this case, from the absence of post-mortem examination, we cannot be sure of the lesion, but the symptoms are so characteristic that I feel satisfied of its waxy character. In commenting upon it, Dr Christison says that the condition of the blood and the urine showed that the affection of the kidneys must have been very far advanced. The excessive reduction of the hæmatosin of the blood, namely to one-third of the healthy proportion, is best explained on the supposition of long continued and advanced disease of the kidneys. The abundance of albumen in the urine corresponds with its scantiness in the blood, which contained scarcely five-sevenths of the healthy quantity of that principle. The presence of a considerable quantity of urea in the blood is a somewhat anomalous fact, considering that the urine was secreted in large quantity.

In a similar case, No. XXV⁷ of Dr Christison's Appendix, he found the blood to have its colouring matter reduced to one-half the healthy proportion, while the albumen was diminished by nearly one-third.

⁷ Op. cit., p. 266.

In case XXVII,⁸ which is a more doubtful example of this disease, the blood was analysed and found to have lost one-half of its hæmatosin.

If I be right in supposing that these were waxy cases, it would appear that the effect of the waxy form on the blood is very similar to that produced by chronic inflammatory changes,—viz., a diminution of the hæmatosin and the albumen, and a retention of urea.

⁸ Op. cit., p. 270.

CHAPTER XII.

THE WAXY OR AMYLOID FORM.

TREATMENT.

THE treatment of the waxy degeneration of the kidney is mainly the treatment of the constitutional state on which it depends or with which it is associated, and that consists of supporting and improving the general health. No medicine is known to produce a direct effect on the waxy degeneration itself. The constitutional debility requires tonic treatment; and considering the impoverished state of the blood, iron is clearly the most suitable remedy of that class. It should be given perseveringly, the form being varied according to circumstances. The tincture of the perchloride, with or without vegetable tonics, such as quassia or calumba; syrup of the iodide alone, or in combination with cod liver oil, the compound syrup of the phosphates, and the saccharine carbonate, are the forms which seem most suitable. Other tonics, as quinine, nux vomica, and the mineral acids, are occasionally useful. The diet should be of the most nutritious description, but regulated with reference to the condition of the stomach. Porter, bitter ale, wine, and well diluted spirits are often useful, both as nutrients and stimulants.

The complications often require most careful management. *Tuberculosis* must be treated in accordance with the principles now generally adopted and well laid down in the standard works on medicine, and more particularly in books specially devoted to the subject, such as that of Professor Bennett. When the *syphilitic cachexia* is present, the patient is often greatly benefited by the use of iodide of potassium, given in doses of from two to five grains, and subsequently in larger amount if occasion require. I am assured by an able observer that he has found sarsaparilla also of great service. When *caries* and *necrosis* are causal complications, no effort should be spared to arrest the drain on the system by operative or other measures. The importance of the relation between these diseases of bone and the waxy degeneration should be carefully kept in view by surgeons. In *chronic suppurations*, also, we must strive to arrest the drain on the system, and towards accomplishing this end great benefit may be anticipated from the antiseptic plan of treatment introduced by Professor Lister.

It appears that none of the concomitant complications are amenable to treatment, except those of the *gastro-intestinal canal*, which manifest themselves by dyspepsia and diarrhœa, and even these too often defy our best efforts. At the head of the list of remedies available for the dyspepsia I would place *nux vomica* and its active principle, *strychnia*. They may be given in the form of the extract of *nux*

vomica, in doses of a quarter of a grain to two grains in pill, or of the tincture in doses of ten to thirty minims two or three times a-day, or, as I think with better effect, in the form of the liquor strychniæ in doses of five to ten minims several times daily. These remedies give tone to the stomach, and improve the digestive power. Mineral acids, particularly the dilute nitro-hydrochloric, may be given in the intervals between the doses of strychnia. Quinine also is sometimes undoubtedly beneficial, and, as has been already remarked, other bitter tonics may be given with advantage. *Diarrhæa* is, in many cases, the most troublesome complication. Logwood is occasionally of some service, the ordinary astringents, such as catechu and kino, have not proved specially useful in my hands; chalk even less so. Opium, on the whole, is the most satisfactory remedy. I have repeatedly seen patients with whom other remedies had failed relieved by enemata containing solutions of nitrate of silver. It may be given by the mouth, or in the form of enema or suppository. Astringents, such as gallic and tannic acids, may with advantage be combined with the opium, especially when it is given by the bowel. Lead and opium pills are also useful. In using opiates we must keep in mind the tendency to head affections, and the danger of interfering with the renal secretion. Solutions of other astringent salts may be similarly useful. The dietetic treatment of this complication is also important. Finely ground farinaceous substances, such as corn

flour and ground rice, serve to check the tendency to diarrhoea, whilst highly flavoured and spiced articles of diet produce the opposite effect. Plain roasted beef or mutton may be given, but soup and vegetables should be avoided.

The treatment of the consequent complications requires no comment beyond what was given under the inflammatory form.

A few words may be added with regard to the remedies chiefly employed in renal diseases. *Diuretics* are of little service in this disease,—the urine being already excessive, their action would be injurious rather than beneficial. They are, of course, useful when inflammation of the tubules supervenes. The most suitable forms are indicated in the chapter devoted to the combined waxy and inflammatory diseases. *Diaphoretics* might seem, at first sight, indicated by the dryness of the skin which sometimes attends the disease, but they are never really needed excepting when dropsy has appeared, or in very advanced stages. *Cathartics* are seldom required, and should be used with caution, on account of the tendency to diarrhoea. I have seen them, however, eminently useful in cases in which inflammation of the tubules had supervened.

In this disease, also, change of climate is often of great advantage; and when this can be combined with the use of chalybeate springs, considerable improvement may be anticipated.

While we cannot cure the disease, the question arises, Is it ever recovered from? No case is on record

in which so happy an event occurred; but I have seen several in which the symptoms were well marked, and yet signal improvement took place.

It is quite consistent with what we know of pathology, that the waxy material might be absorbed and healthy tissue deposited in its place, but there is no positive evidence that this occurs.

I have in several instances observed a marked diminution of the size of the liver, a change which could only be explained on the supposition that the waxy material had been absorbed and normal tissue had taken its place. In cases XXIX and XXXIII the liver was much enlarged at one time, and exhibited all the features which characterise waxy degeneration. In the course of months or years the organs gradually diminished in size, and on post mortem examination the mass of the hepatic substance was found free from disease, the degeneration being confined to patches here and there. This being the case with the liver, there is no reason to think that it may not occur in the kidney also.

A result so favourable may of course be looked for only when the cause of the degeneration is removed. If it has, for example, resulted from caries, no improvement can be looked for so long as the caries continues. If, on the other hand, the caries be cured, there is ground for hope that its consequences also may ultimately disappear.

Temporary improvement is very frequent; indeed few patients fail to rally more or less under judicious medical treatment.

CHAPTER XIII.

THE CIRRHOTIC OR CONTRACTING FORM.

MORBID ANATOMY.

THIS disease cannot, like those we have already considered, be said to pass through distinct stages, for it exhibits throughout its course one uniform character. *It consists essentially of an hypertrophy of the connective tissue of the organ, and a consequent atrophy of all the other structures.*

In the commencement of the process there is little diminution of the bulk of the organ, but the capsule is somewhat thickened, is less easily torn off than usual, and the surface, instead of being smooth, is uneven, scarred, rough, and granular. This is generally equally diffused throughout, but sometimes more marked at individual points. The colour is in some cases pale, in others reddish. Congested veins may often be seen ramifying on the surface. There is, in uncomplicated cases, little or none of the dense sebaceous like material which is so constantly present in the atrophic stage of the inflammatory form. On section the cortical substance is found relatively diminished, the diminution most marked towards the surface. The small arteries are unduly prominent,

their walls thickened, and their cavities often dilated. Even by the naked eye and by touch we recognise an increased density and fibrousness of structure. On the surface and in the substance, particularly the cortical part, cysts are frequently seen. On microscopic examination the one constant change is found to be increase of the fibrous stroma.

When the disease is more advanced the kidneys are much reduced in bulk, but the characters of the organ are essentially the same as those given above. The two kidneys may be of the same size, or one may be more atrophied than the other. It is, however, singular that even when the disease is furthest advanced the cones are comparatively little affected; the cortical substance may be reduced to a very thin layer, perhaps one-sixth of its natural size, and yet the cones be but slightly wasted. In this stage, also, it is remarkable how little sebaceous looking material is observable in the tubes. But the prominence and thickening of the arteries is very marked. On microscopic examination with a low power (50 diameters) the small arteries are found much thickened, the malpighian bodies are closer together, their size varies more, and they are less conspicuous than they are in the atrophic stage of the waxy form; the tissue between them, particularly in the most atrophied parts, presents little or no appearance of tubules, it is an irregular but dense fibrous mass.—*Plate VII., fig. 1.* When the tubules are still present there is little of the opaque material which is so prevalent in

the inflammatory cases, but it is not altogether wanting. Translucent hyaline matter is more common. Under a higher power (300 to 400 diameters) the increase of the fibrous tissue and the atrophy of the tubular elements are very distinct. The malpighian bodies are seen to be surrounded by dense fibrous tissue, their capsules greatly thickened, and the tubules compressed and atrophied by the increase of inter-tubular substance.—*Plate VII., fig. 2.* At the same time many tubules may be found quite unaffected. Pigmentary matters are often seen in the tubes, principally within the epithelial cells.

Cysts are very common, especially in the cortical substance. Some originate in the capsules of the malpighian bodies, and the compressed group of vessels may be seen towards one side. Some result from obstruction of tubes and consequent dilatation of the distal portion. Some, again, are produced from morbid growth of epithelial elements.

A peculiarity occasionally met with, particularly in gouty subjects, deserves special notice. It was well described by Dr Garrod.¹ There is a deposit of a chalk-like substance in the form of streaks; these white lines are chiefly in the direction of the tubes, in the pyramidal portion; some, however, are in the cortical part. The mamilla of each cone also presents the appearance of little white points from the deposition of the same matter. These white deposits are

¹ Garrod on Gout, p. 237.



composed of needle-like crystals of urate of soda, and are situated in the stroma of the organ, as well as in the tubules, chiefly in the former.

It may be asked how a cirrhotic kidney is to be distinguished from one in the third stage of the inflammatory or the waxy disease. By attention to the following points the careful observer will have little difficulty in referring any specimen to the proper category. In the cirrhotic the capsule is thickened, and is torn off with difficulty; in the inflammatory and waxy it is less thickened and more readily separable. In the cirrhotic the surface is very uneven, is frequently studded with cysts, and presents little or no sebaceous looking material; in the inflammatory and the waxy the surface is less uneven, cysts are less common; while in both, particularly the inflammatory, sebaceous looking material is very abundant. In the cirrhotic most of the tubules which remain are healthy; in the inflammatory most or many of them are filled with exudation and fatty debris of cells, and many may be found in process of atrophy, their lumen being blocked up; in the waxy they may contain such exudation, but much more commonly they contain translucent coagulated material, and cells containing finely granular substance. In the cirrhotic the small arteries are greatly hypertrophied; in the inflammatory this also occurs, but to a less extent; in the waxy the capillaries and many of the small arteries are thickened, translucent, and, moreover, they react characteristically with iodine. In the cirrhotic the

stroma is greatly increased, especially towards the surface; in the inflammatory and waxy the stroma, though increased relatively to the other tissues, is not absolutely above the normal amount.

What is the true pathology of this disease? It has been very generally assumed that it results from inflammation of the stroma, in the course of which connective tissue is formed, and that this increased formation leads to the secondary changes. This is the view advocated by Dr Dickinson, whose researches have materially contributed to the elucidation of this form of disease. There can be no doubt as to the latter part of the statement, but as to the former the evidence appears defective. I know of no observation which warrants the assertion, that in the earliest stage free exudation is to be found among the elements of the stroma, and, as we shall presently see, there is much reason to think that there is no such exudation. In the absence of direct evidence, this view appears to rest upon two considerations,—*1st*, that the formation of connective tissue is a common result of inflammation; and *2d*, that the analogous disease of the liver is supposed to result from inflammatory action.

As to the first of these, it must be remembered that excessive formation of connective tissue is not exclusively connected with inflammation. It occurs as a distinct new formation in tumours, and unquestionably arises from simple hypertrophic growth. We are indebted to Dr Handfield Jones² for an elaborate

² British and Foreign Medico-Chirurgical Review, 1854, vols. xiii, p. 369, and xiv, pp. 36 and 329.

and able discussion of the question of its non-inflammatory origin. After describing fibrous patches and deposits as they occur in the serous membranes, the arachnoid, the pericardium, the pleuræ, and the peritoneum, as well as in the valves of the heart, in certain forms of cirrhotic liver, in the mucous and submucous tissues of the stomach, in the substance of the testicles, the uterus, and the lungs, he argues—"that in all these instances the process may be from the first non-inflammatory, depending on the exudation of blastema, tending abnormally to fibre development, and not simply maintaining the nutrition of the part." He says, again, that the hypertrophy causing the increase and thickening of fibrous tissues goes on and on, as a substantially independent process, totally unassociated with any trace of inflammation, even though it may by possibility have originated in it. My observations amply confirm the chief conclusions of Dr Handfield Jones. The only point on which I differ from him is, that I have not seen evidence of an exudation or blastema; but it is not improbable that in using these terms he was influenced by the pathological theories prevalent at the time he wrote.

From his observations, confirmed as they are by my own experience, I am satisfied that it is unwarrantable to assume, without positive evidence, that in any individual disease increased growth of connective tissue is a result of inflammation.³

As to the second of these points, viz., the analogy

³ See Foerster's *Handbuch der Pathologischen Anatomie*, 2te Auflage, 1863.

of the cirrhotic kidney with the cirrhotic liver, it must be borne in mind that, in regard to the latter disease we have no positive evidence of inflammation. The stage of atrophy is the condition most commonly met with, and in it there is no free exudation among the connective tissue. The earlier stage in which the organ is enlarged comes occasionally under observation, but its increased size is found to depend solely upon connective tissue, not upon free exudation. No observation is on record to show that a stage preceding this exists, in which free exudation is to be found. Thus the evidence with regard to the liver is so unsatisfactory that no argument from analogy can be founded on it.

On the other hand, we have, I think, positive evidence that there is no free exudation in the cirrhotic kidney. We often have opportunity of examining cases which are evidently advancing, and in which no trace of such material can be found. Indeed, in every case the process is more advanced towards the surface than it is in the deeper parts, and here a little examination enables us to make out that there is no evidence of exudation.

Moreover, in such an organ as the kidney, if free exudation be poured out, it must almost of necessity affect the tubules, and these are, as we have seen, not primarily involved. The clinical history of the disease also confirms this view, albuminuria not being an early symptom, which, in a truly inflammatory affection it would certainly be.

It may be asserted that, though no free exudation

exists, the connective tissue nevertheless results from an inflammatory process, but I know no evidence in favour of such a view, and the theory of a simple hypertrophy of connective tissue best explains the pathological and clinical phenomena.

The names which have been applied to this disease are very numerous. The "contracting kidney" is good, inasmuch as it refers to one of its most important and obvious features; but, seeing that contraction or atrophy occurs in the advanced stages of the other forms of Bright's Disease, the term is apt to lead to some confusion. The term "gouty kidney," although very appropriate in some cases, would be unsuitable in many, inasmuch as, on the one hand, the disease often occurs independently of gout, and, on the other, gout may be accompanied by other renal diseases. The name "intertubular or interstitial nephritis" is also unsatisfactory, inasmuch as it assumes the existence of an inflammation of which there is not sufficient evidence. The name "granular kidney" is inappropriate, inasmuch as the surface of kidneys, in the third stage of the inflammatory and the waxy disease, are often nearly as distinctly granular as are those under consideration. The last name to which I shall refer, the "cirrhotic kidney," although etymologically incorrect, is, in my opinion, the most appropriate, as it indicates the most prominent feature and essential characteristic of the disease, viz., the increase of the connective tissue, and yet implies no theory as to its origin. For this reason I prefer to call it cirrhosis of the kidney.

CHAPTER XIV.

THE CIRRHOTIC OR CONTRACTING FORM.

CLINICAL HISTORY.

THE earlier symptoms are very slight ; such, indeed, as might easily escape notice. I have seen several cases in which the renal lesion was sufficiently distinct on post-mortem examination, but in which there had been no albuminuria, and no dropsy during life. Still, in a large proportion of the cases symptoms do exist, and a careful observer will not fail to detect the malady.

It is specially a disease of male adults ; occurring perhaps with increasing frequency in successive decades of life, but frequently met with far advanced in individuals between twenty and thirty. It is more common in, although by no means confined to, the gouty constitution, and is met with in all forms of the arthritic diathesis. In many cases it is unsuspected until secondary diseases manifest themselves. I had some years ago under my care a gentleman who considered himself in very fair health until he was suddenly seized with an epileptic fit. On seeking an explanation of this attack, I found his urine distinctly albuminous, and discovered a history of this form of renal disease. Another gentleman, at present my patient, had a fit as

the first intimation that he was out of health ; and a considerable number of cases have come under my observation in which the earliest symptom which attracted their attention was dimness of vision due to albuminuric retinitis.

Patients are in some cases obliged to rise several times every night in order to micturate. The secretion is often pale, and of rather low density. In amount it is at, or somewhat above, the natural standard. These characters it generally retains throughout the whole course of the disease, until the later stages, when a considerable increase of the amount is often observed. In the early stages albumen is occasionally present, generally in very small quantity. One day it may be distinct, but the next day we search for it in vain. Tube-casts, hyaline or finely or coarsely granular, may also be found if carefully sought, but are very apt to be overlooked by the inexperienced observer. There is not unfrequently, even in the early stage, a peculiar anæmic appearance, and dyspepsia and thirst are often complained of. At first there is no dropsy, and cases sometimes run through their whole course without any distinct œdema appearing. But generally there is occasional swelling of the feet or ankles, usually to such an extent as to produce a degree of tightness of the boots at night, which has disappeared by the morning. The eyelids are, however, often puffy, and the conjunctivæ dropsical, presenting the character styled by some

physicians "the Bright eye." Ascites also is occasionally present, but the amount is trivial. In some cases, however, the dropsy is severe, and then it depends either upon an intercurrent inflammation of the kidneys, or upon cardiac, hepatic, or pulmonary complications. As the malady advances the general health gives way, the strength diminishes, the anæmia becomes more pronounced. There is an increasing unfitness for exertion. The patient has a chronic cough, has little power of reaction, easily catches cold, and often suffers from headache. In this state he may linger for months, or it may be years. But the disease is making progress — gradually the albumen increases in the urine, the appearance grows more unhealthy, certain pulmonary and gastric symptoms become distressing, the strength diminishes, and gradually or suddenly a fatal aggravation of the symptoms ensues. He is seized with uræmia, with apoplexy, with sudden oedema of the lungs, or with acute inflammation, and so dies. A patient, originally of vigorous constitution, sometimes survives the most alarming attacks, and is restored for a longer or shorter time to comparative health; but at length they recur, and he sinks often suddenly in the end. The variety in the nervous symptoms in this disease is very remarkable—convulsions, coma, delirium, delusions of the senses, and maniacal excitement, are each of them occasionally met with. One nervous complication of much interest which often occurs towards the end of the case is dimness of vision, a conse-

quence of retinitis, with fatty degeneration of its tissue and hemorrhage into its substance.

In illustration of the clinical history, I select the following cases:—

CASE XXXIV.—*Cirrhotic kidney; tubercle of lungs and intestines; no dropsy nor albuminuria.*—J. M., æt. 65, was a gardener, and was admitted to the Royal Infirmary, under the care of Dr Sanders, November 7th, 1865. He had always been a sober and generally a healthy man till the end of September, when he took cough and pain in the chest. The sputum was purulent. The urine was 40 ounces daily, acid, of sp. gr. 1020, contained no albumen nor any deposit. He had no dropsy. Towards the end of November he took diarrhoea, and from that time became worse. He died January 20th, 1866.

Autopsy.—The body was emaciated. The visceral layer of the pericardium was œdematous. The heart substance was fatty; the valves were competent, but somewhat thickened; the aorta was atheromatous. Both lungs contained tubercle and tubercular cavities. The liver was fatty. The spleen was natural. There were some tubercular deposits and ulcers towards the lower end of the ileum. The kidneys were small and pale, their surface slightly granular; the cortical substance was somewhat diminished; the fibrous stroma was distinctly increased. A few of the tubules contained exudation, and some a little pigment, but the majority were quite natural.

Commentary.—In this case we had a distinct change in the structure of the kidneys without any urinary symptom, the quantity and quality of the fluid having been natural. The death resulted from the tubercular disease of the lungs and intestine.

CASE XXXV.—*Long-standing cirrhosis of kidneys; repeated pregnancies; amblyopia; neuro-retinitis; hemorrhages; pericarditis; peritonitis; gastritis, &c.*—Christina Stewart, æt. 24, married, born in Inveresk, resident in Edinburgh, was admitted to the Royal Infirmary, under my care, October 17th, 1870, complaining of cough, pain in the stomach, vomiting, and swelling of the face.

History.—The patient enjoyed good health until six years ago, when her eye-sight became affected so that she could scarcely see; but under treatment her power of vision was perfectly restored. For five or six years past she has been troubled with frequent micturition, having been obliged to get up during the night two or three times, and she has noticed the quantity of urine passed to be sometimes excessive. Fourteen months ago she was confined of a child (which is now living), and two or three months after this her face became swelled. She again became pregnant, but miscarried about the fifth month of pregnancy in May last; since then she has never been well. During her pregnancy she suffered a great deal from vomiting, and this has not improved since her miscarriage; and at the same time her eyesight again became affected. These conditions have been accompanied by severe pain in the stomach, and great thirst. She has always been of temperate habits, but her general surroundings have been unfavourable.

Family history.—Her father and mother died of consumption.

On admission.—Temperament phlegmatic; complexion pale; general appearance anæmic; attitude natural; temperature 98·7.

Alimentary system.—The lips are anæmic; the teeth good; tongue furred, but moist; deglutition natural; appetite bad; she vomits daily; her bowels are confined; liver of natural size.

Circulatory system.—Pulse 116, regular, but small. The arteries are in an atheromatous condition. System otherwise normal.

Blood system.—Normal.

Respiratory system.—Form and action of chest natural. On percussion the resonance is good. On auscultation, under the right clavicle anteriorly, the expiration is prolonged, and the accompaniments are sibilant rales, with slight increase of vocal resonance. She has a slight cough and a scanty muco-purulent sputum.

Integumentary system.—Face oedematous, especially the eyelids and conjunctivæ.

Urinary system.—She has passed 40 ounces of urine in the 24 hours; it is of natural colour; of specific gravity 1015, and contains a small quantity of albumen, and also crystals of triple phosphates, but no tube-casts.

Reproductive system.—She has not menstruated for some time.

Nervous system.—There is retinitis of both eyes, the left being more affected than the right. She is troubled with bad dreams.

Diagnosis.—Contracting form of Bright's Disease.

Treatment.—She was ordered a cough mixture.

Oct. 21st.—Cough less troublesome; urine 40 ounces, loaded with albumen. Patient retched during the day, but did not vomit.

Oct. 22d.—Urine 40 ounces. Patient suffering from acute pain in the epigastric region. The pain is increased both by food and pressure.

Oct. 24th.—Urine 36 ounces; alkaline; still loaded with albumen; pain in stomach nearly gone; there is subconjunctival ecchymosis of the left eye; pulse 108, and small.

Oct. 25th.—Urine 30 ounces. The œdema of the face is increasing, and she is now troubled with considerable dyspnoea. On auscultation of the chest a friction murmur is heard a little external to and below the angle of the right scapula. Respirations 24 per minute. She was ordered, in addition to her other medicine, 20 drops of the tincture of the perchloride of iron three times a-day.

Vespere.—This evening patient is suffering from excruciating pain at the back of the left eyeball. Ordered to have two leeches applied to the left temple.

Oct. 26th.—The pain in the orbit is now gone, but the eye is completely closed, and the lower eyelid is everted and highly oedematous. Mr Walker was called in, and made incisions into the oedematous and everted conjunctiva. The patient has had considerable bleeding from the nose to-day, and, as it became serious, a plug soaked in a mixture of equal parts of Liquor Ferri Perchloridi and water was introduced into the nostril. There is also a great deal of pain over the cardiac region, and the sounds of the heart are unusually distinct, but no further abnormal condition of the heart can be detected. The pulse is 116, and deficient in tone. The urine is 30 ounces, and still loaded with albumen.

Oct. 27th.—Patient feels easier this morning, but was very restless last night, owing to severe dyspnœa and pain in the epigastric region. Pulse 92.

Oct. 28th.—There is a good deal of pain in both orbits to-day. A leech was applied to each temple.

Oct. 29th.—The pain not abating last night, a subcutaneous injection of morphia was administered, which gave her a good night's rest. Urine 33 ounces. Pulse 108—scarcely perceptible. Respirations 64 per minute. There are occasional startings of the limbs. The eyelids are now quite closed by œdema.

Oct. 31st.—Patient is weaker to-day. Pulse 104—very feeble. The œdema of the eyelids is increasing.

Nov. 1st.—Patient is about the same as yesterday. The upper lip is affected with herpes labialis. There is still much dyspnœa, slight dullness is found at the right base of the chest behind. At this point the expiration is prolonged, the respiration harsh, the vocal resonance increased, and there are occasional sonorous rales. At the left base the respiration is prolonged, character harsh, no accompaniments present, and the vocal resonance is normal. Ordered to have hot poultices continuously applied.

Nov. 2d.—Passed a somewhat restless night. Eyelids still oedematous. Pulse still very feeble. There is not so much dyspnœa, and the area of the dullness has not increased. The auscultatory signs are unchanged.

Nov. 3d.—Slept pretty well last night. There has been a re-

currence of epistaxis. Patient complains of intense pain in the epigastrium, for which hot poultices were applied. There has also been a good deal of vomiting. Ordered six ounces of gin. Respiration easier.

Nov. 4th.—The œdema of the face and eyelids is diminishing, and there is not so much epigastric pain, but the vomiting still continues. The urine is loaded with albumen.

Nov. 5th.—The patient passed a bad night. The œdema of face has again increased, especially the left eyelid, and the left cheek is red, tense, and very tender. Ordered twenty drops of the Tinctura Ferri Perchloridi every two hours, and the part to be enveloped in cotton wadding. The breathing is easy. Pulse 88.

Nov. 6th.—The condition of the left cheek is improved.

Nov. 7th.—The patient passed a bad night, and suffered from great pain in the abdomen, and from epistaxis. The swelling of the face is more diffused, but the redness and tenderness have diminished. As patient complained of pain after taking the iron, it was ordered to be omitted until the evening, but as the redness had then again increased, and the abdominal pain was easier, it was recommenced.

Nov. 8th.—Patient passed a good night, and feels much easier this morning. The iron has been continued. The œdema of the face and eyelids is much less, so that she can now easily open her eyes, but she cannot distinguish any objects. The ocular conjunctiva is much injected in both eyes, and there is an ecchymosis in the subconjunctival tissue, on the nasal side of left eye, and the pupil of this side is much contracted. Dr Argyll Robertson examined ophthalmoscopically, and found in the left eye the vitreous humour to be opaque (either from bloodclot or some growth), but the contracted state of the pupil prevented a satisfactory examination. In the right eye large white masses were seen in the retina, probably the result of fatty degeneration, but here also the view was not clear. Ordered to continue the iron three times a-day, and also the cotton wadding externally.

Nov. 9th.—The patient has passed a very bad night. Last evening she was seized with an attack of vomiting, bringing up a

quantity of matter like coffee-grounds ; this was followed by great pain all over the body. She did not sleep much, but constantly dosed for a few minutes, often awakening with a loud scream. She also kept on grinding her teeth at intervals. This morning she appears much distressed, and in violent pain. The urine is 30 ounces ; its sp. gr. 1010 ; and it contains a large quantity of albumen. Her pulse is 112, and weak ; her breathing is very hurried ; and she constantly grinds her teeth, and screams, and has short convulsive attacks. Ordered Bromide of Potassium in 30 gr. doses, and warm fomentations to the lower extremities.

8 P.M.—Her condition remains unimproved. Vomiting has again occurred ; the character of the vomited matter being the same as before. Still much convulsed. Ordered half an ounce of gin diluted with water every half-hour.

Nov. 10th.—Passed a very bad night. To-day the vomiting has become very severe, but is unchanged in the character of the rejected matter. She is also suffering from diarrhoea, and is passing blood in her stools. There is also great pain and tenderness in the abdomen, increased on pressure. The pulse is 104, and somewhat “wiry” in character. The œdema remains the same. Ordered half a grain of opium every two hours, and turpentine stupes and hot fomentations to the abdomen.

8 P.M.—The vomiting is constant, and she can retain nothing, but the pain is somewhat easier. Passes her water in moderate quantity. Pulse 116—rather improved in strength.

Nov. 11th.—Patient had a restless night, and again was troubled with incessant vomiting and purging. The pulse is 112, and very much weaker.

Nov. 12th.—She had a better night, and only vomited once, and the purging has now ceased. Pulse 100, and of better tone. This afternoon, however, as the vomiting has returned, and as she can retain no food, a nutrient enema, containing beef tea, brandy, and laudanum, was administered.

Nov. 13th.—The enema was repeated at midnight with marked benefit. The enema now to be given three times a-day. She complains of great pain in the throat.

Nov. 14th.—Last night she vomited a quantity of bilious matter, and this bilious vomiting has returned this morning. Ordered three minims of dilute hydrocyanic acid every two hours.

Nov. 15th.—Condition unimproved. Vomiting continues. Brandy to be administered at frequent intervals. She complains of great thirst.

Nov. 16th.—Patient remains in much the same state. There is no pain except in the throat. Pulse 96—small. Urine 15 ounces; sp. gr. 1015.

Nov. 17th.—The vomiting still continues, but she passed a somewhat quiet night. She is very weak, and passes her motions in the bed. Pulse 98.

Nov. 18th.—Patient is very much weaker, and still passes her excreta in bed. She is quite unconscious, and has lost all control over the sphincter muscles, so that the enemata are now discontinued. Pulse 90—very weak.

Vespere.—Patient gradually sank, and died at 7 P.M. this evening.

Autopsy.—The body was very much emaciated.

Thorax.—The pericardium presented numerous adhesions, and there was a quantity of recent lymph on the surface of the heart; the left ventricle was much hypertrophied, and the margins of the mitral valve were slightly thickened. Old adhesions were found on both pleural surfaces, and both lungs contained a few old cheesy masses. The right lung was congested and oedematous.

Abdomen.—The liver weighed 3 lb. 6 oz., and was not much enlarged, but pale on the surface. The addition of iodine gives indication of the presence of a slight degree of waxy degeneration.

The *Spleen* was of normal size, and not waxy.

The *Kidneys* were considerably smaller than normal. The capsule was removed with difficulty on account of small fragments of kidney substance adhering to it. The surface presented a granular appearance, and there were cystic formations in the substance of the organ. The cortical substance was relatively much diminished in size. The fibrous stroma was markedly increased. A few of the tubules contained sebaceous looking material. Many

of the smaller arteries were dilated and their walls thickened. Many of the malpighian bodies were diminished in size. There was no trace of waxy degeneration.

The *Stomach* was in a state of chronic catarrh, and presented numerous points of extravasation.

Intestines.—The mucous membrane of the lower part of the ileum presented signs of inflammation. There were evidences of peritonitis at the lower part of the abdomen, and the mesenteric glands were enlarged.

The *Brain* was œdematous, but otherwise healthy.

Commentary.—In this case the disease had unquestionably been of many years' standing—certainly five or six, perhaps more. The sudden and temporary blindness which affected her six years before death may have been an example of the so-called uræmic form of eye affection. The disease must have commenced at latest at the age of eighteen. For five or six years she had been disturbed during the night by calls to micturition, and had herself noticed that the urine was at times in excessive quantity. During the process of the disease she was several times pregnant, but there was never any convulsion; the labours seem to have been natural, and the children healthy. She miscarried in the fifth month of her last pregnancy, but even then there was no unfavourable symptom. A year before admission her face had been swollen, and during her last illness the œdema was sometimes very considerable, but she never had general dropsy. During the last month of life the urine was rather below the natural amount. The sp. gr. was 1015; the quantity of albumen was

never large ; and no tube-casts were discovered. She suffered much from sickness and vomiting, and on post-mortem examination catarrh of the stomach and hæmorrhagic erosions were found. In the lungs there were some evidence of tubercular process and of pleurisy, associates with (especially in the latter stages) congestion and œdema. The nervous symptoms were of great interest. The severe headaches were at times her chief complaint. The eyes presented very typical examples of neuro-retinitis with hæmorrhages. The hæmorrhages under the conjunctiva and apparently under the cellular tissue behind the orbit were interesting as the only example I have seen in this disease. The heart's sounds were healthy at the date of admission—that is, they were unattended by murmur. A few weeks before her death they were observed to be louder than natural. This was the result of the hypertrophy, and I have no doubt existed on her admission as well as at the time it was noticed. On account of her condition in respect of the breathlessness and the peritoneal symptoms, the heart was not examined for some time before her death, and in consequence the pericarditis was not detected. The erysipelatous affection of the face yielded readily to treatment, and the peritonitis was considerably relieved by the external applications and sedatives. On her admission, a diagnosis of cirrhosis of the kidney was established, and the post-mortem examination showed that this disease existed in an advanced stage.

CASE XXXVI.—*Cirrhotic kidneys, polyuria, bronchitis, pleurisy, pericarditis, uræmia, death.*—John O'Hara, æt. 23, was admitted into Ward VII, under the care of Dr Balfour, on October 26th, 1867. States that he has only been ill four weeks, that he has always previously been healthy, and, in particular, that he never suffered from syphilis. From his dissipated character, all these statements are not, however, to be implicitly trusted.

On admission.—He suffers from debility, with considerable thirst, attended with the passage of a pale almost colourless albuminous urine, averaging about 120 oz. in the 24 hours. The albumen ranges from a mere trace when passing only 100 oz. of a density of 1012, to $\frac{1}{10}$ when passing 125 oz. of a density of 1011. The average specific gravity was 1011. Hyaline casts are occasionally observed in it. He has fatty degeneration of both retinae, as observed through the ophthalmoscope. During his residence in the Ward he had occasional attacks of hemoptysis, and from this and the existence of dullness beneath the right clavicle and slightly prolonged expiration the existence of tubercle in that part of the lung was inferred. He was treated with full doses of iodine, with the view of lessening his thirst and polyuria, without effect. Subsequently full doses of the perchloride of iron were administered, and for a time his drink was restricted, but no amount of restriction sufficed to reduce his urine below 80 ounces; and the actual amount of his polyuria may be inferred when it is mentioned that this restricted amount, which lasted for a few days, is included in the average given above. He was discharged on the 22d of January 1868 in *statu quo*.

On the 15th of April he was re-admitted into Ward IX, in a semi-unconscious state from drink, covered with bruises, and labouring under severe bronchitis. From his noisy behaviour he had to be removed from Ward X, and after some days' treatment—chiefly with carbonate of ammonia—being apparently somewhat quieter, he was again removed to Ward VII. He never properly recovered consciousness, was always more or less noisy, complained of no pain, and nothing could be detected in his chest but loud sonorous rales and coarse crepitation, while his amaurotic

condition precluded any diagnostic value being attached to his dilated pupils. He died on the 25th of April—noisy to the last.

Autopsy.—The face and feet were slightly œdematous. There was recent pleurisy of the left side. The lungs were emphysematous at their margins, and œdematous throughout. At the apex of the right lung there were traces of old tubercle, and in the middle lobe there was a considerable amount of recent tubercular deposit. The pericardium (visceral and parietal) was coated with a thin layer of recent lymph; the membrane was congested. The heart was dilated and hypertrophied; its valves were natural; its auriculo-ventricular orifices dilated; its muscular substance was granular and fatty. The peritoneal cavity contained a considerable amount of yellow serum. The liver was enlarged, somewhat congested. There was some increase of connective tissue towards the centres of its lobules, round the hepatic venous radicles. The spleen was normal. The kidneys were much diminished in size; their capsules were somewhat adherent; the surface was rough and granular; the cortical substance was greatly reduced in size relatively to the cones. On microscopic examination the fibrous stroma was found much increased; the vessels were not waxy, but the smaller arteries were thickened; many tubules were completely atrophied, and some contained cells in a state of fatty degeneration. The brain was natural.

Commentary.—This patient was a man of dissipated habits, and never had nephritis. The renal disease must have been of long standing, although he dated its commencement only six months before his death. Dr Balfour was inclined to suspect waxy disease from the large amount of water passed; but the post-mortem examination proved the case to be one simply of cirrhosis. It is thus interesting, as showing, along with other cases, that polyuria, although so constant in the waxy disease, is not

exclusively associated with it. The recent pericarditis and pleurisy, as well as the fatty degeneration of the retina, and the consequent amaurotic condition, were well worthy of attention. It may be doubted whether the nervous symptoms which he exhibited after his return to the Hospital were really uræmic; but, considering that they lasted for ten days after the debauch which induced the fatal attack, we are warranted in believing that they were. There was no convulsion, but simply a semi-delirious noisy condition.

In recording the next case, I cannot do better than extract a portion of its history from Dr Bennett's work¹ on the Principles and Practice of Medicine.

CASE XXXVII.—*Chronic gout, with tophaceous deposits in all the joints, cirrhotic kidneys, pneumonia, pyæmia, (?) death.*—Thomas Burns, æt. 42, a tobacco-pipe maker, admitted November 4th, 1857. Says he first became ill in Glasgow about ten years and a-half ago, with pain and swelling in both his big toes. Soon afterwards the ankles and knees became affected. He was confined for a month, being unable to walk, or even to put on his shoes. Since then he has had on an average three such attacks every year, spring and autumn being the worst seasons; but he has rarely been confined by them more than a week. The attacks have generally commenced with rigors, followed by more or less fever and swelling in one or other of the joints. Almost every joint in his body has suffered in this way at one time or another. At the

¹ The Principles and Practice of Medicine, by John Hughes Bennett, 5th edition, p. 991.

first attack, he says, chalk stones formed in his toes, and since then they have appeared in his feet, knees, elbows, and hands. The right hand especially has been much deformed by them. He is in the habit of cutting down upon and extracting them whenever they approach the surface and are unusually painful. He has been twice in the Infirmary, and was on both occasions dismissed relieved. The present illness commenced suddenly six weeks ago, and has more especially affected the ankles. He has undergone a great amount of treatment, having been bled and cupped, and having taken much medicine. He had been accustomed to drink a good deal of porter, as well as of spirits, until three weeks before his first admission, in June 1856, since which time he has been more temperate.

On admission.—He complains of pain in the left wrist and both ankle joints, which latter are swollen, and pit on pressure. The joints of the fingers are nodulated and crooked, especially those of the right hand, hard to the feel, with numerous tophaceous deposits visible through the shining and stretched integument, about the size of millet seeds. The elbow and knee joints are similarly affected with several deposits over the olecranon and patella of each limb. The toes are not so distorted as the hands. There is a pain on pressure over the right lumbar region, with a slight trace of albumen in the urine. Other functions normal.

Nov. 25th.—Small abscesses have appeared over the patella and heel, to which poultices have been applied.

Dec. 18th.—Last night was seized with severe lumbar pain and general febrile symptoms, and on examining the urine it was found to be highly albuminous. The sediment contained numerous epithelial cells from the kidney, with granular and desquamative casts of the tubes.

Dec. 21st.—Is much better. Albumen in the urine diminished.

Jan. 6th, 1858.—Since last report has been comparatively free of pain, and doing well, but last night was again seized with severe febrile symptoms, accompanied by painful sensations throughout his body. To-day the joints of the extremities, especially those of the hands, are very painful.

Jan. 8th.—He has been perspiring much, and is better, although pains in joints are still very severe. The poultices have brought away several fragments of the tophi near the surface. They are of a pale yellow colour, friable, and when examined under the microscope present a mass of needle-shaped crystals of urate of soda.

Jan. 22d.—The pains in the joints have now been absent for ten days, and he was dismissed.

Thus far I have quoted from Dr Bennett, omitting only the various prescriptions which were given during the prolonged residence in the Hospital.

He had no attack of gout from the time of leaving the Infirmary until early in January 1860, when he was seized with rigors, which were followed by deposit of soft pulaceous fluid in the neighbourhood of the joints. These deposits gradually dried up. The joints of the hands and feet and the knees were affected. The heart sounds were natural. There were signs of some consolidation towards the upper parts of both lungs. There was no pain over the kidneys. The urine was in good quantity, of a pale amber colour, specific gravity 1011, contained much albumen, and a few hyaline tube-casts. He slept badly on account of the constant pain in his feet. His tongue was furred and dry, his appetite poor, and his bowels loose.

April 21st.—Since last report the patient has continued in the Hospital, and has had occasional acute exacerbations of pain, generally attended by deposits of urate of soda in the joints. The successive deposits were at first fluid, but gradually dried up and formed chalk stones. The urine varied from 70 to 90 ounces daily, but never was in excess of the fluid consumed. It was always albuminous, was sometimes loaded with urate and sometimes with phosphates, and on careful examination a few hyaline casts could be detected.

June 9th.—After the date of last report the patient gradually improved for some weeks; but about the end of May he was seized

with subacute pneumonia, the amount of urine then diminished to 30, 20, and ultimately to 12 ounces per diem. He had no dropsy. He never had any convulsion nor loss of consciousness, but became quite insensible to pain, and assured me almost with his last breath that he was feeling better. He died on June 9th.

Autopsy.—Heart and pericardium natural. There were old adhesions on the right side of the chest, recent lymph and a little turbid fluid were found in the left side. The lungs were dark coloured, and in a state of solid œdema, each contained a little tubercle in the apex. Abdomen—On cutting into the liver, several small abscesses were found scattered through it; each containing a little pus. There was no increased vascularity around them. The left kidney was very small, and irregular on the surface. On cutting into it a number of small yellowish white deposits of urates were seen in the medullary substance. The right kidney, though small, was larger than the left; it felt firm, was somewhat irregular on the surface, and contained two or three cysts, and several small deposits of urates. In the spleen several small abscesses, similar to those met with in the liver, were found.

Commentary.—This patient was under the care of Drs Bennett and Laycock successively, and was for a considerable time well-known to the students attending the clinical wards. He exhibited a typical example of gout and of the gouty kidney. The urine was in good quantity, but never in great excess, its specific gravity was rather low, and it generally contained albumen and tube-casts, though not in large amount. He never had dropsy. The state of the nervous system for some days before death was very peculiar. There were no convulsions, scarcely even a twitching of the facial muscles. The consciousness of mental impressions remained perfect to the last, but there was no sense of pain or weariness.

CASE XXXVIII.—*Cirrhosis of kidneys ; albuminuric retinitis ; polyuria ; epistaxis ; death by uræmia.*—George M'Riner, æt. 22, single, carter, born at Midealder, resident at Roseburn, was admitted to the Royal Infirmary under my care, Dec. 13th, 1869, complaining of polyuria, great thirst, weakness, and dimness of vision, pain in the lower part of his chest, and in the calves of the legs after any exertion. He has been ill for four or five weeks.

History.—The patient was always in good health, and did not notice anything the matter with him until twelve months ago, when he found that he was passing an excessive amount of water, and that he was troubled very much with thirst. The calls to micturition were so frequent as to be remarked by his friends. No other symptom attracted his attention until about five weeks ago, when he noticed that his eyesight was becoming impaired, and on making any exertion he experienced great pain in the calves of his legs. The patient has always had good food, but he has been intemperate in the use of spirits for some time. His general surroundings have been favourable, and his family history is unimportant.

State on admission.—Patient is of sanguine temperament, of ruddy complexion, and is of good build, and rather above the average height.

Alimentary system.—Normal, except that he is troubled with great thirst.

Circulatory system.—The percussion of the heart is normal. On auscultation there is heard a systolic murmur, loudest at the base. The pulse is hard and regular. The arteries are slightly thickened, and their pulsation is visible. The face is flushed.

Blood system.—The white corpuscles of the blood are somewhat increased in number, and the red have a tendency to be altered in form. The spleen is of natural size.

Respiratory system.—Normal.

Nervous system.—Patient complains of dimness of vision, which renders him unable to read the papers or to see any objects at a distance. The pupils are dilated. On ophthalmoscopic examination, Dr Argyll Robertson found the characteristic appearances of albuminuric neuro-retinitis.

Integumentary system.—Face flushed. Skin of a dusky hue. No trace of œdema.

Urinary system.—No lumbar or vesical pain. Patient has passed 95 ounces of urine in the twenty-four hours; it is of pale colour; acid reaction; sp. gr. 1009; and contains a large quantity of albumen. On microscopical examination, no tube-casts could be detected.

Treatment.—Patient was ordered 20 drops of the syrup of the iodide of iron three times a-day.

Dec. 17.—Patient is much troubled with epistaxis. The amount of urine is 110 ounces during the twenty-four hours; and he uses 100 ounces of fluids.

Dec. 18.—Complains of frontal headache. Urine 120 ounces, being 18 ounces more than the total amount of fluid taken during the same period.

Dec. 20.—Headache still troublesome. He has had several rigors. Quantity of urine 145 ounces.

Dec. 21.—Patient is very poorly to-day. He is constantly shivering, and cannot keep himself warm in bed. The frontal headache is severe. Urine 160 ounces.

Dec. 22.—The shivering and headache are no better. Quantity of urine 130 ounces. Ordered—

R. Pulv. Doveri gr. x.

Pulv. Antimon. gr. iij.

Misce.

Mitte tales duo. *Sig.* One immediately and one at bed-time.

Dec. 23.—Patient feels greatly better to-day. The shiverings are gone, and there is but little headache. The urine amounts to 90 ounces. Pulse 100. Temperature normal.

Dec. 24.—Urine 70 ounces. Headache nearly gone. The fauces are somewhat congested.

Dec. 25.—Urine 60 ounces; the albumen is increased in amount. The patient complains of sore throat, and also of pain in the lower limbs. There is no œdema.

Dec. 28.—The patient is very drowsy and heavy. Bowels constipated; ordered castor oil. Throat still sore.

Dec. 29.—The drowsiness of the patient is much greater. The urine measures 58 ounces, and the amount of albumen is large. Epistaxis recurred this morning.

Dec. 30.—Patient remains much in the same condition. He sleeps during the greater part of the day and night. Urine 60 ounces.

Jan. 3.—Patient's condition has remained unchanged until this afternoon, when he was seized with several uræmic convulsions, and died at 4 P.M. Dry cupping was applied over the kidneys on the appearance of the convulsions. The urine during the twenty-four hours had amounted to 70 ounces, and was loaded with albumen.

Autopsy.—The detailed report having been mislaid, I am only able to state that the kidneys were in a state of advanced cirrhosis.

Commentary.—From the state of the kidneys it is evident that the disease must have existed for several years before it attracted the patient's attention, and he died at the age of 22. We have in this, then, another example of its occurrence in youth. As to the cause we know nothing, excepting that the patient acknowledged to having been intemperate. The first symptoms noticed by him were polyuria and thirst, which preceded by ten months the occurrence of albuminuric retinitis and muscular pains in the limbs. The changes in the retina were well marked, and were the immediate cause of his application for medical advice. The points most worthy of notice while he was under treatment were the ruddy healthful appearance of the face, the complete absence of dropsy, the polyuria and great thirst, the eye symptoms, the epistaxis, and the sore throat, along with

uræmic symptoms, commencing a week before death, with drowsiness, passing into coma, and terminating with convulsions. The ruddy complexion I have often seen in this as well as in the waxy disease. The complete absence of dropsy was to be expected. The polyuria and thirst are not unfrequent in the advanced stages. The epistaxis I have seen much oftener in cirrhosis than in any of the other forms of Bright's Disease. The sore throat, again, has often occurred along with, or shortly before, the commencement of the uræmic symptoms. These symptoms themselves were very interesting, in respect of their insidious commencement and sudden change of character.

CASE XXXIX.—*Cirrhosis of kidney ; severe vomiting ; neuro-retinitis, commencing five months before death. Death from uræmia.*—John Paterson, æt. 49, a shoemaker, presented himself as an out-patient at the Royal Infirmary in May 1870, complaining of dimness of vision, kidney disease, and vomiting. He had been recommended to me by Dr Argyll Robertson, who gives the following account of his case :²—

“He consulted me on account of dimness of vision on 17th May 1870. He states that he enjoyed very good health, ‘never lying a day in his life,’ till eleven weeks ago, when, after a severe rigor, he was attacked the following evening with very severe vomiting, attended with distracting pains in the head and back of neck, and sometimes in the loins. The vomiting lasted to a greater or less degree for four weeks. The matters vomited varied much, being sometimes bilious. Once vomiting lasted from 2 A.M. till 9 P.M., even a drink of water not staying on the stomach.

² Edinburgh Medical Journal, Jan. 1871.

Was frequently very drowsy, and would fall asleep even while sitting on a chair. He has never had any oedema of the ankles or eyelids. For the last twelve months he has had to make water more frequently than formerly, especially during the night, and he passes a larger amount than he used to do. He suffers much from thirst, and has to get up at least six times during the night to get a drink of water.

"His sight was not markedly affected till about a fortnight after the commencement of his sickness, when his vision suddenly failed him one morning, everything appearing veiled by a thick mist, while the previous evening his sight had been quite clear, and he was able to read as usual. He also saw black motes floating in the mist, and a few weeks later bright spectra appeared before him. The mistiness has continued to the present time, but has somewhat diminished in degree, so that now he sees better than he has done since the original attack. The stooping posture gives rise to a feeling of heaviness and pain in the head, and increases the dimness of vision. About three or four months ago he had double vision for a few minutes, but it has not recurred.

"The patient was rather anæmic, but otherwise appeared healthy. The pupils were of natural size and mobile, and the media were clear. With the left eye No. CC. of Snellen's types can be read at 15 feet; with the right eye, assisted by a weak convex lens (+ 28), No. XL., at same distance. Ophthalmoscopic examination reveals the presence of albuminuric retinitis. In the left eye the macula lutea was the seat of extensive fatty degeneration, and the retina between it and the optic papilla clouded with exudation. At several points small extravasations of blood had occurred into the retina. The optic nerve was also infiltrated with exudation, and two small blood extravasations were visible in the optic papilla. The right eye was similarly affected, but the disease was less advanced, and the blood extravasations more numerous. The urine was pale and highly albuminous. The patient was ordered iodide of potassium in gr. v. doses, and counter-irritation by means of the biniodide of mercury ointment applied to the temples." . . . "This man had no suspicion

of any serious affection beyond impairment of vision when he applied to me for advice, and the ophthalmoscopic appearances led to the detection of the renal malady."

Paterson only came to the Infirmary as an out-patient once. But on October 21st, 1870, he was admitted to Ward VII. under my care, having been visited at his own home by Dr Stephenson. His wife stated that on account of the symptoms above referred to the patient had been unable to work since May. On October 11th he was unable to get up; complained of headache, which was, however, relieved after vomiting. Since this he has had a number of vomiting fits, frequently bringing up the food which he had just taken. At 3 o'clock on the morning of the 13th he took a convulsive fit, during which the body trembled violently, and the tongue was bitten so that blood escaped from the mouth. He afterwards fell asleep, and on awaking remembered nothing of his attack. From that time till his admission he had five fits, all of them, except the last, occurring at 3 o'clock. His sight was much worse than it had been in May.

On admission.—He was quite delirious—not raving wildly, but constantly writhing and moaning. When spoken to he understood what was said, and often answered sensibly, but always when asked about pain said that he had none, and insisted that he was quite well. His water and motions were passed involuntarily. His breath had a urinous odour. His urine was not deficient in quantity, and some which was drawn off by the catheter was of a clear colour, acid reaction, of specific gravity 1013, and contained a considerable quantity of albumen. He derived no benefit from treatment, and died three days after admission.

Autopsy.—The body was well nourished, and not cedematous.

Head.—The dura mater was very pale, as also was the brain substance. The choroid plexus was anæmic. There was a quantity of serum in the ventricles. The vessels at the base were slightly atheromatous.

Thorax.—The heart weighed 14 ounces. The pulmonary and aortic valves were competent. The aorta and one of the segments of the mitral were slightly atheromatous. The mitral and tricuspid

valves were competent. The whole organ was greatly hypertrophied, especially the left venticle.

The *Lungs* were very œdematous.

Abdomen.—The liver was adherent to the diaphragm. It was congested, but otherwise healthy.

The *Spleen* was congested, but otherwise healthy.

The *Kidneys*.—The right kidney was much contracted; it weighed $2\frac{1}{2}$ ounces. On its surface was a cyst about the size of a small marble. The left was also contracted, weighing 3 ounces. On section the cortical substance had nearly all disappeared; the pyramids, which were not well marked, presented a greyish appearance. The capsules separated readily, and revealed a well-marked granular surface.

The *eyes* were found to present fatty degeneration of parts of the retina, with extravasations of blood into the substance.

Commentary.—The points of interest in this case are very similar to those in the last. There was in both the advanced cirrhosis, manifesting itself by polyuria and eye symptoms, and terminating in uræmia with torpor and convulsions. The patient lived upwards of five months after the occurrence of the eye symptoms.

CASE XL.—*Cirrhotic kidney; slight albuminuria; dropsy*.—S. M., a house painter, æt. 53, resident in Edinburgh, was admitted to the Royal Infirmary, under my care, April 24th, 1866. Patient stated that, as a rule, his health had been good till 1863, but within the three years intervening he had had five attacks of lead colic. Being a painter by trade he was much exposed to the lead poisoning. Three years before, he found his health failing, he was easily fatigued, and his breath was very short.

On admission.—He was found to be labouring under chronic

pleurisy and pericarditis, with little effusion. He was passing urine in fair quantity (45 ounces per diem). It contained albumen in small quantity, and was of normal specific gravity. He was very anæmic and feeble, had slight dropsical effusion in the eyelids and feet. The liver and spleen were natural. The extensors of the forearm were feeble and wasted, but there was no actual paralysis. He was treated with chalybeate tonics and diuretics, and after a few weeks' treatment so far improved as to be able to leave the Hospital. Some months afterwards he returned, presenting much the same symptoms, but considerably weaker than he had formerly been. Under treatment he again rallied, and I have not seen him since.

Commentary.—This case, although incomplete in consequence of my having lost sight of the patient, was undoubtedly one of the cirrhotic kidney, and it illustrates several points in the natural history of the disease. The patient was a house painter, and he had suffered from lead poisoning, a condition which, as we shall presently see, occasionally causes the disease. The quantity of urine was about normal; and it was but slightly albuminous. There was some dropsy, and considerable anæmia. The dropsy yielded to treatment, and the blood also materially improved under the remedies employed.

CASE XLI.—*Repeated attacks of lead colic; lead palsy; hemiplegia with slight aphasia; albuminuria.*—John Telford, æt. 50, house painter, a native of Stirling, resident in London, was admitted to the Royal Infirmary, under my care, on April 22d, 1871, complaining of inability to use his right arm and leg properly, and also the fingers of his left hand. He had been ill for eight months.

History.—The patient states that six years ago he had an

attack of lead colic, and a second one two years afterwards, followed six months later by a third attack, and these happened notwithstanding that he was always cleanly in his habits, and accustomed to the use of sulphuric acid. Two years ago he became affected with lead palsy while at work in London, and at the same time the sight of the right eye became somewhat impaired, so that distant objects appeared hazy and indistinct. He came to Edinburgh for advice—was admitted into the Royal Infirmary, where he remained for two months, and was then discharged quite cured, both of the weakness of sight and of the loss of power of the extensor muscles of the fore arm. The present illness commenced eight months ago. The patient states that he was decorating a ceiling in Windsor Castle when he believes he suddenly lost his consciousness, and fell a distance of fully 7 feet; he was immediately conveyed to the Infirmary at Windsor, and remained unconscious for two or three days. On recovering his consciousness he states that he found that the right side of the body was paralysed, and that he could no longer express himself in words, although he could make articulate noises, and knew what he wanted to say. He remained a month in the Infirmary, during which time he improved greatly in the power of language, and also in the use of the right side. He then attended as an out-patient the “National Hospital for the Paralysed and Epileptic,” where he was faradized twice a-week; but not improving much, he came to Edinburgh, and was admitted under my care.

Patient has always had good food, and has rarely drunk to excess. His general surroundings have been favourable, except in regard to the nature of his calling. Family history unimportant, except that his brother is now a patient in the Infirmary, suffering from aphasia.

State on admission.—Patient is of sanguine temperament. He has apparently been a very muscular man.

Alimentary system.—The gums are anæmic, and present a faint blue line at their junction with the teeth; the tongue is flabby and much swelled, from a fissure caused, as he thinks, by the teeth biting it about twelve days ago during his sleep—the

centre is covered with a yellow fur, while the edges and tip are red and clean; the saliva is much increased in quantity; he experiences a good deal of pain in swallowing, so that he eats but little, although his appetite is good. The liver is normal. There is no œdema, ascites, or tumour in the abdomen.

Circulatory, Respiratory, and Integumentary systems.—Normal.

Urinary system.—Patient states that he makes his water very frequently; but the amount of urine does not seem to be large. He has no lumbar, vesical, or urethral pain or uneasiness. The urine is of a pale amber colour, with a sp. gr. of 1015, and acid in reaction, and it contains a slight trace of albumen.

Nervous system.—There is a feeling of numbness, tingling, and cold, with diminution of the sensibility to pain, heat, and tickling on the right side of the body. The sight of the right eye has been impaired since the paralysis came on, but Dr Argyll Robertson states that the ophthalmoscope showed nothing abnormal, further than a slight reduction in the size of the arteries. The hearing of the right ear appears dull, and the sense of taste is apparently defective on both sides. The smell appears to be natural. The muscular sense is good, and the reflex moter functions are normal. The muscular power of the right side is impaired, especially that of the extensor muscles of the upper and lower extremities, and more particularly of the extensors of the left forearm, and the muscles of the ball of the thumb. The electro-sensibility and electro-contractility of the muscles is diminished on the right side, especially the electro-sensibility. There is no special tenderness. Patient is frequently at a loss for words, and occasionally utters words totally different in meaning from those he intends. His memory is good; he sleeps well, and is not troubled with bad dreams.

Locomotor system.—There is atrophy of the extensor and flexor muscles of the forearms—that of the extensors being especially marked.

Treatment.—He was ordered to be faradized daily, and to take 5 grains of iodide of potassium every eight hours.

July 27th.—Since admission the patient has considerably im-

proved, both in general health and in respect to nervous and muscular symptoms. He has had no recurrence of the fits, and the quantity of the urine has remained about, or slightly above, the normal standard. It has always contained a slight trace of albumen. No tube-casts have been found.

Commentary.—This case is introduced as an example of cirrhosis probably not far advanced, and certainly a result of lead poisoning. There is full evidence that that poisoning exists, and the albuminuria must be referred to one of the forms of Bright's Disease. None of the characteristic symptoms of either the inflammatory or waxy forms occurs, and I have no doubt that it is the cirrhotic form which is present. There has been no dropsy, and the quantity of urine is not yet excessive. The amount of albumen is slight, and no tube-casts have been found. The quantity of solids, as indicated by the urinometer, is scarcely below the normal. At the time of his admission his tongue was deeply cut, and he stated that this had occurred one night when he was in bed, and that he knew nothing of it till he awoke. It was clear that he had suffered an epileptic attack, but whether this was due to the renal disease or not we could not determine.

CASE XLII.—*Gout, albuminuria, cirrhotic kidney.*—John Stewart, a native of Manchester, a coppersmith, æt. 43, came to Edinburgh for medical advice, and was admitted to the Royal Infirmary under my care in March 1868. Patient stated that he enjoyed good health up to the age of fourteen, when he had an attack of quinsy, which terminated by bursting and discharging

matter. This quinsy returned regularly every year up to the age of twenty-four. At twenty-five he went to America, and after four or five years' residence there he was attacked by ague. This kept him laid up for about two years, when, thinking there was no chance of his getting better if he stayed in America, he returned home, and soon afterwards became quite well. He was treated with quinine in America, but he thought with little benefit. About six years after the disappearance of the ague he was attacked by gout. It began by a pain in the ball of the great toe of the left foot, coming on suddenly about two or three o'clock in the morning. By the next day the pain had extended to the ankle, where it continued for three days, and then disappeared. Three weeks afterwards pain appeared in his left elbow, and continued shifting about till two years ago, when he was attacked by rheumatic fever. Since that time the pains have never left him. Towards the end of the fever a pain came on in the cardiac region. This has gradually been getting worse, and on the slightest exertion he is subject to breathlessness and violent beating of the heart. The day before he entered the hospital a severe pain came on in his left wrist. His father, he states, died of a stomach complaint, probably gastric ulcer. His mother is living, but subject to rheumatism. His sisters are healthy. About the time when he went to America he first began to drink ale and porter, and has been a beer drinker to a considerable extent ever since.

On admission.—Respiratory system normal. *Circulatory system* normal. *Digestive system*—Tongue dry, and covered with a whitish brown fur. His appetite is not good, but what food he takes agrees with him pretty well. He complains of great thirst. (This thirst continued up to the day of his death, and during all his stay in the Ward he drank large quantities of water, lemonade, &c.) His bowels are regular. The spleen is considerably enlarged. *Nervous system*—Complains of pain in the left hand and wrist, which are swollen, and tender to the touch. *Integumentary system*—Perspires a great deal at night. *Urinary system*—Urine has an acid reaction. Sp. gr. 1012, contains a small quantity of albumen.

He was treated with acetate of potass and *actea racemosa* with little benefit.

April 7th.—Symptoms of pericarditis made their appearance.

April 12th.—Patient complains of a superficial ulceration on the mucous member of his mouth.

April 15th.—Ordered to have liquor epispasticus applied to his left wrist, and effused serum to be kept and tested for uric acid. The serum effused from the blister was tested, but no uric acid could be discovered. The pericarditis never became severe, and gradually subsided.

May 10th.—The pains have been shifting about from joint to joint a great deal for some days past, but have begun to disappear. Urine still continues albuminous. Quantity passed 108 oz.

May 12th.—The urine was analysed. Quantity of urine passed was 100 oz., and the amount of urea was 40·64 grammes = 627·23776 grains, or 1·31 oz. in 100 oz.

20th.—The patient has so far improved as to be able to leave the Hospital.

Commentary.—This was a typical case of cirrhotic kidney, as was afterwards proved by post-mortem examination. The previous history and the symptoms were alike characteristic of the disease. The further history of the case is given as illustrating the combined cirrhotic and inflammatory diseases, of which the patient ultimately died. I shall refer to one point only at present,—the analysis of the urine. The amount of urea was not diminished; it was, indeed, nearly as high as the maximum of the tables given by Dr Parkes.² This was very interesting, considering that the kidneys were considerably wasted.

² The Composition of the Urine, by Edmund A. Parkes, M.D., p. 7.

CASE XLIII.—*Cirrhosis of kidney; neuro-retinitis; chronic uræmia; temporary recovery.*—James Stein, æt. 28, single, mason, resident in Edinburgh, was admitted to the Royal Infirmary, under my care, on the 10th of February 1870, complaining of defective sight, dyspepsia, polyuria, and swelling of the legs. He had been ill for two or three years.

History.—The patient states that he was quite healthy until two or three years ago, when he first noticed that he had occasion to pass his water more frequently than usual, requiring him to get up two or three times during the night to micturate. But in November 1868 there occurred a diminution in the quantity of his urine, and the quantity became scanty, and this was soon followed by swelling of the whole body, including the face and eyelids. Under treatment, however, the swelling subsided, and in four or five weeks' time he was able to resume his work, which he had been obliged to relinquish on account of the dropsy. He soon again began to pass too much water, and has been gradually losing flesh, but noticed nothing otherwise wrong until a week ago, when he found his sight was defective, so that he could not accurately determine the clear outline of objects, and he noticed appearances like bright stars before his eyes. This was accompanied by a sharp pain through the head, and was followed in a day or two by severe pain in the abdomen, with diarrhœa, which has continued up to the present time. The imperfection of the vision daily becoming worse, and preventing him from working, he yesterday sought advice at the Eye Dispensary, and was then referred to the Infirmary. Patient's habits as to food and drink have been good; and his general surroundings have been favourable. Family history unimportant.

State on admission.—Temperament sanguine; complexion fresh; general appearance that of a healthy man.

Alimentary system.—Teeth good; gums pale; tongue moist, flabby and large, and somewhat furred. Secretions of mouth deficient; thirst great; appetite fair. Suffers a good deal from flatulence. No vomiting or nausea. Bowels much relaxed,

eight or ten motions daily ; and the fæces are very liquid and bloody in character. Hepatic dullness $3\frac{1}{2}$ inches vertically in the mamillary line. Palpation of abdomen natural, except that there is pain between the umbilicus and pubes, increased on pressure.

Circulatory system.—Normal. Pulse 84, regular. The capillaries of the cheeks are injected.

Blood system.—There is a slight increase of the white corpuscles of the blood. Blood glands normal.

Integumentary system.—Skin moist and anæmic, except the cheeks. No eruption ; legs somewhat swollen.

Respiratory system.—Normal.

Urinary system.—Experiences some pain and uneasiness in the lumbar regions. There is no vesical nor urethral pain. The desire to micturate is very frequent ; and he passes his water as many as ten or twelve times in the twenty-four hours. The urine is pale in colour, with a sp. gr. of 1011, and contains albumen. On microscopical examination of the deposit, numerous epithelial cells and fragments of tube-casts in a state of fatty degeneration were seen.

Nervous system.—Normal, except as to the defective sight.

Feb. 11th.—Patient has passed 90 ounces of water in the twenty-four hours. The diarrhœa continues, but the fæces are not so bloody.

Ordered ten minims of syrup of iodide of iron three times a-day.

Feb. 12th.—Urine 110 ounces. Complains of a good deal of pain in the forehead and eyes. A mustard plaster to be applied to the nape of the neck.

Feb. 13th.—Urine 120 ounces. Pain in the head better, but there is more uneasiness in the lumbar region. The mustard to be again applied to the nape of the neck.

Feb. 14th.—Urine 110 ounces. Uneasiness in the loins still considerable.

Feb. 15th.—Urine 120, pale in colour ; sp. gr. 1009 ; acid in reaction, and contains albumen. The diarrhœa continues, but there is less pain in the head and eyes, and also in the loins.

Feb. 16th.—Urine 130 ounces.

Feb. 17th.—The diarrhoea continues, but is less severe. The pain in the head and eyes is also very troublesome.

Feb. 18th.—Urine 120; albumen abundant; pains better.

Feb. 19th.—Urine 105 ounces, and contains hyaline and granular tube-casts and a few red blood discs. Patient feels somewhat better.

Feb. 20th.—Urine 115 ounces. Complains of a heaviness at stomach. The legs swell towards night.

Feb. 21st.—Urine not measured, but the patient believes it to be less in quantity. His appetite is becoming very poor, and he is much more taciturn than he was. This morning he threw himself on his bed, moaned, and complained of great pain in the head and abdomen.

Feb. 22d.—Patient has passed a very restless night; he moaned frequently, and complained of intense frontal and abdominal pain. Early this morning he was found sitting on the edge of his bed attempting to dress, but apparently very distressed. He called for a drink, but was unable to hold the cup to his lips, and he then threw himself across the bed upon his belly and moaned in a peculiar manner. Soon after he began to retch, and brought up two or three mouthfuls of frothy matter. It was noticed at the time that his head was very hot. He was noticed to pass his water once pretty freely. This morning before visit hour he was very drowsy, and did not answer very readily, and complained of pain in the abdomen only. At 1.15 P.M. he lay in a peculiar semi-comatose condition, and spoke only when roused. His voice was then found to be altered, and to have become husky, and he still complained of the severe pain in the head and abdomen. He eats scarcely anything; and his tongue is dry, irritable, and covered in the centre with a brownish fur. No urine has been passed this morning, and he expresses no desire to pass any. The eyelids are somewhat œdematous. 9 p.m.—Patient has remained in much the same condition. His pulse is 108, and his temperature 98.4. His head has now been shaved, and croton oil applied.

Feb. 23d.—Patient has passed a quiet night, and is much

easier to-day. At visit he was not so drowsy, and answered much more readily. His eyelids were more œdematous, but there was no swelling of the legs. The pain in the head and abdomen is not so severe. His tongue is cleaner and less irritable, and he has taken his food pretty well to-day. His pulse is 98, strong and regular. The amount of the urine is 20 ounces, and it is of pale colour, of sp. gr. 1009, and contains much albumen. The voice is still husky. No dullness at the base of the lungs.

Feb. 24th.—The eyelids are now quite closed; but there is an absence of all œdema in the legs and scrotum, &c. The tongue is furred, and the voice is still husky, but better than yesterday. Patient lies very quietly, but answers directly when addressed. There is still a little tendency to diarrhœa. Pulse 84, of fair strength. Temperature 97·8. Has passed 10 ounces of water since 6 a.m. Dr Argyll Robertson examined his eyes to-day, but with difficulty, owing to the œdema of the lids. In the left eye the previously recognised extravasations and effusions were still present, but the latter were more distinct and of a whiter colour.

Feb. 25th.—Patient has passed a quiet night. The amount of the urine is 70 ounces; its sp. gr. 1011, and amount of albumen is small. The œdema of the lids is less marked. No pain now in abdomen.

Feb. 26th.—Patient had a good night, and feels better to-day. He has passed 72 ounces of urine, of sp. gr. 1011, and containing only a small amount of albumen. The eyelids are not so swelled, and can be opened a little, but the upper lip is somewhat œdematous. Pulse 92, good. The voice is still husky. There is scarcely any pain in the head, and none in the abdomen.

Feb. 27th.—Patient was rather restless last night, and to-day is very drowsy; but the œdema of the eyelids is diminishing, and the legs remain free from it. The tongue is cleaner, and the bowels are natural. Has passed 91 ounces of water. Pulse 108, of fair strength.

Feb. 28th.—There is a decided improvement to-day in his appearance. He can now open his eyes well. Urine 68 ounces; only a slight cloud of albumen present. Pulse 110, rather weak.

The voice is better, but is still altered. The appetite is improving.

March 1st.—The eyes and lips are now free from œdema. He has passed 100 ounces of urine; the water is pale coloured, and has a sp. gr. of 1011; there is a slight cloud of albumen. Pulse 110, of fair strength. Voice improving. Tongue cleaner.

March 2d.—Patient now expresses himself as being quite well while lying in bed, but on attempting to rise he feels very weak. The pulse is 96, and stronger. The amount of urine passed is 90 ounces; sp. gr. 1011. The voice is now the same as it was on admission. No pain.

March 3d.—Feels about the same as yesterday. Pulse 92, of pretty fair strength. Tongue pretty clean. Appetite good. Urine clear and pale, 78 ounces in quantity; sp. gr. 1010. More albumen present.

March 4th.—Urine 101 ounces; sp. gr. 1011; albumen less. Pulse 94. Feels a little pain in the forehead to-day.

March 6th.—Urine 104 ounces; sp. gr. 1013; rather more albumen present. On microscopical examination of the deposit there were found fragments of finely granular tube-casts. Patient feels very weak, but otherwise pretty well.

March 7th.—Patient got up to-day for an hour. He has passed 91 ounces of pale coloured urine, of sp. gr. of 1011, and only slightly albuminous. Pulse 98, and rather weak. There is slight comparative dullness at the base of the left lung, and in both lungs posteriorly the respiratory murmurs are feeble. There are occasional muscular twitchings of the arms.

March 8th.—Urine 93 ounces, and rather turbid,—the turbidity being but slightly increased on the application of heat or nitric acid; its sp. gr. is 1011. The pulse is 90, and weak. Patient sleeps pretty well, and his appetite is good, but he does not feel strong enough to get up to-day. Temperature normal.

March 9th.—Urine 89 ounces; very little albumen; sp. gr. 1010. The pulse is 100, weak, but regular. The twitching of the arms continues.

March 10th.—Patient is still very weak. Pulse 92, and weak. He has had diarrhœa for a few days past, and it is much worse

to-day. Urine, 75 ounces; sp. gr. 1009; it contains very little albumen. The temperature remains normal.

March 11th.—Pulse 88, less. Diarrhoea not so severe. Urine 80 ounces. Temperature normal.

March 12th.—Patient feels sick to-day, and has no appetite. His tongue is rather furred. Urine 75 ounces; sp. gr. 1011; a slight cloud of albumen. Pulse 90, but not so weak. Temperature normal.

March 13th.—Had a good night, but does not feel so well. Pulse 100, weak. Temperature normal. Urine 73 ounces.

March 14th.—Patient passed a fair night, but the diarrhoea is again troublesome. Had castor oil and laudanum administered. The tongue is rough, dry, and furred. The pulse is 96, rather stronger. The twitching of the hand still present. Urine 72 ounces; sp. gr. 1013. Temperature 99·6.

March 15th.—Appetite improving. Tongue moist, but furred. Temperature 99·8. Urine 76 ounces; sp. gr. 1010, with but little albumen. Pulse 100.

March 16th.—Urine 70 ounces. Pulse 106. Tongue furred, brown, and dry.

March 17th.—Urine 70 ounces. Tongue brown and dry. Pulse 90, and rather weak, but patient feels pretty well. Temperature 99°. The twitchings of the hand continue.

March 18th.—Urine 68 ounces. Pulse 94. Patient feels pretty well. Tongue furred, but moist.

March 19th.—Patient having arranged to go home was dismissed to-day at his own request.

The patient went to the country, and was seen by Dr Hamilton of Falkirk. He continued in much the same state for a week or two, and then took uræmic symptoms and died. Permission for a post-mortem examination was not obtained.

Commentary.—This was a well-marked case of the cirrhotic form. The diagnosis may be regarded as certain, although it was not confirmed by post-mortem

examination. The eye-symptoms, the polyuria, and the peculiar form of uræmia, were very characteristic. I was induced to try the effect of the application of croton oil to the scalp, and the result was very satisfactory, for the patient recovered from a state which in my experience had always ushered in death. Fifteen months before his death he had an inter-current inflammatory attack, which soon subsided under treatment. The case is recorded mainly on account of the effects which I thought were obtained by the application of counter-irritants to the scalp.

CASE XLIV.—*Cirrhosis of kidney; diagnosis of Bright's Disease by the ophthalmoscopic appearances, &c.*—Charles Grant, æt. 21, van-driver, formerly a waiter in a public-house, native of Gogar, resident in Edinburgh, was admitted to the Royal Infirmary, under my care, on March 25th, 1871, complaining of dimness of sight and disease of the kidneys.

History.—The patient believes himself to have been quite healthy until two weeks ago, when the dimness of sight commenced. He had previously suffered from low fever (? typhoid) at the age of ten; scarlet fever somewhat later, from which he made a good recovery, and which was not followed by dropsy. He has had three slight attacks of fever since. When employed as a waiter he took a good deal of beer and spirits, but was always able to get up in the morning, take a good breakfast, and do his day's work. He has had a good deal of cough for some months past, and two months ago he began to make large quantities of water. He was obliged to rise four times during the night, and suffered from thirst. He thinks that he never made an excess of water before, and is certain that he never had dropsy. A fortnight ago he noticed his eyesight dim, particularly in the

left eye ; distant objects appeared misty ; near objects were obscured by spots of light, which were apparent whether the eyes were shut or open. On account of these symptoms, he applied to Dr Argyll Robertson, who recognised by the ophthalmoscope the characters of albuminuric retinitis, and recommended him to put himself under my care. Until he consulted Dr Robertson, patient had no idea that his kidneys were affected.

State on admission.—The temperament is sanguine ; the complexion ruddy ; the general appearance healthy and vigorous. Temperature natural.

Alimentary system.—The lips, teeth, and gums are natural. The tongue is slightly furred and indented at the edges ; the mouth is dry, the appetite is good, and there is great thirst ; the bowels are regular, and the liver measures six inches superficially in the mamillary line.

Circulatory system.—There is no pain or uneasiness in the heart or vessels. The apex-beat is natural in position ; the transverse superficial dullness of the heart measures $2\frac{1}{4}$ inches ; the second sound is accentuated at the base. The pulse is full and firm, and the radial arteries are somewhat thickened.

Lymphatic and blood systems.—Natural.

Respiratory system.—There is distinct comparative dullness at the lower part of the left lung posteriorly. Over the area of dullness the respiratory murmur is harsh.

Integumentary system.—The skin is generally dry, but the patient perspires freely on exertion.

Urinary system.—There is no pain or uneasiness, excepting a peculiar heavy feeling in the small of the back. The quantity of the urine is 86 ounces, of which 80 were passed during the night. He states that he always makes more water during the night than during the day. The urine is of a pale lemon colour ; of acid reaction ; throws down a scanty precipitate ; the sp. gr. is 1020 ; it contains a small amount of albumen.

Nervous system.—Normal, except in respect of the eyes, which exhibit the characteristic appearances of albuminuric retinitis.

Treatment.—Patient is to have good diet, and a drachm of the syrup of the phosphate of quinine, iron, and strychnia twice daily.

The patient remained under treatment for a month. The daily amount of urine ranged from 80 to 130 ounces. The albumen was scarcely to be detected sometimes, at others it was pretty copious. The eye symptoms did not get worse, but rather improved. He was dismissed, and returned to work on April 24th 1871. In June he presented himself again at the Infirmary as an out-patient ; he was in the same state as formerly, excepting that the albumen was more copious.

Commentary.—Although this case has not come to post-mortem examination, I think it will not be doubted that it is an example of cirrhosis, and that in an advanced stage. The first feature that deserves notice is the age of the patient, who is now only twenty-one. There seemed to be a distinct history of excessive indulgence, although not perhaps of actual intemperance. The eye symptoms, which came on only a fortnight before admission, were so very marked as to enable Dr Argyll Robertson to diagnose the case without hesitation as one of Bright's Disease. The heart was probably somewhat hyphertrophied, although the position of the apex beat was not altered. The radial arteries were certainly sclerosed, and the pulse unnaturally full and hard. The enlargement of the liver suggested the possibility of waxy disease, but the history of the case and the other symptoms pointed to cirrhosis. The particulars which weighed with me were the absence of any history of wasting disease, the history of spirit-drinking, the fact that the polyuria had come on so recently, and the albumin-

uric retinitis. Such a combination I have never seen in a waxy case. No uræmic symptoms have appeared ; but they might do so at any time, although the specific gravity of the urine has never been low.

CHAPTER XV.

THE CIRRHOTIC OR CONTRACTING FORM.

NATURE OF THE SYMPTOMS.

IN this disease, again, we have to consider the symptoms connected with the Urine, the Dropsy, and those dependent on the Nervous System.

I. *The Urine*.—The quantity is, in the earlier stages, at or slightly above the healthy standard, but when the kidneys have become considerably wasted I have frequently seen the quantity greatly increased. The tubules which remain are not occluded, and so, there being no counter pressure to oppose the blood pressure, the secretion is free. But how does it happen that, while much of the kidney is atrophied, a natural or even excessive amount of fluid transudes? A satisfactory explanation of the fact is afforded by a consideration of the physical condition of the vessels of the organ. There is, on the one hand, considerable obstruction to the capillary circulation, and, on the other, the left ventricle of the heart is hypertrophied. We have thus the two great factors for increasing blood pressure in the arteries, and consequently an increased tendency to transudation of fluid; while at

the same time, the tubules being free, there is no such counter-pressure as exists in the earlier stages of the inflammatory form. There may be some change in the capillary walls, whereby excessive transudation may occur, but such a change has not yet been discovered. It is not unlikely that in many cases the amount of urine is regulated by the amount of fluid consumed, but this cannot be accepted as the sole explanation, seeing that in one of the cases recorded experiments were carefully conducted, from which it appeared that diminution of supply of fluid was not accompanied by a corresponding diminution in the secretion of urine. Perhaps a further explanation may one day be found in some abnormal condition of the blood, whereby its watery parts more readily permeate the capillary membrane. Albumen is rarely present in any considerable quantity, and its presence—fitful in its appearance, and varying in its amount—is also difficult of explanation. The tube-casts are generally few in number, hyaline or finely granular, but sometimes fatty. They consist of coagulated fibrine which has been effused into the tubules, mingled with more or less altered epithelium. The specific gravity is commonly low, and the colour pale. I have found in one or two well marked cases the quantity of urea little if at all below the natural standard. Other observers have found the urea distinctly decreased, particularly in the later stages. Uric acid is also lessened or quite absent in advanced cases. Phos-

phates, sulphates, and chlorides are also much diminished.

II. *Dropsy* is in some cases entirely absent, but more commonly is present now and then, especially as the disease approaches its fatal termination. Even then it has, in the cases which I have observed, appeared only when an inflammatory exudation into the tubules had become superadded to the primary disease. In several well-marked cases, such as that of Thomas Burns, I have seen the patient free from dropsy to the last. The slight degree of œdema which frequently occurs may be due either to the anæmia or to the renal affection, or to their combined influence.

III. *The Nervous Symptoms* commonly included under the term uræmia not unfrequently make their appearance in the disease when the case is far advanced and still uncomplicated, but more particularly when an inflammatory condition has been superadded. The symptoms are various, sometimes convulsions, sometimes delirium, and sometimes coma being most prominent. Moreover, they come and go in a singular manner, being at one time severe, at another time slight—appearing and disappearing in a way that we cannot explain. The mode of production is probably here essentially the same as in the other forms; much of the renal secreting structures being destroyed, a retention of the excrementitious

matters, which are usually eliminated by these channels, necessarily follows, and it is to this retained material that the symptom is due. But in the uræmic attacks of cases of this kind I have frequently been struck with the anæmic appearance of the patient, and have been led to suspect that the deficient nutrition of the brain had induced the attack.

Another nervous symptom which is worthy of special attention is headache; the crown of the head is its special seat in some cases, in others the side of the head; and sometimes the pain is diffused. It resembles in character that which sometimes follows severe hemorrhages. It may exist for a long time independently of uræmia, and seems to arise from the deteriorated state of the blood. Certainly its amenability to treatment by means of the chalybeate tonics favours this view.

Yet another nervous symptom often occurs, viz., pains of a rheumatic character; at all events, pains which are generally described by patients as rheumatic. They flit about from part to part, but tend specially to affect the extremities, and are generally difficult of cure. These symptoms, though most markedly connected with the cirrhotic affections, do sometimes co-exist with the other forms.

CHAPTER XVI.

THE CIRRHOTIC OR CONTRACTING FORM.

COMPLICATIONS.

IN considering the complications of the cirrhotic kidney, we shall take, first, those of the Consequent, and second, those of the Concomitant class. Both are of much importance in relation to the natural history of the disease. It is indeed not uncommon for the renal malady to be detected only when the complications have drawn attention to it.

(a) *Consequent Complications.*

1st, Hypertrophy of the Heart is of frequent occurrence, being sometimes a result of concomitant valvular or vascular diseases, sometimes a result of the renal malady alone. In a series of cases which I examined post-mortem, nearly one-half (46 per cent) had enlarged heart, simply from kidney disease, while many others had enlargement connected with the lesions above referred to. Though less common in the early stages, I believe that it is present in almost every advanced case.

It probably owes its origin in this affection to the

same circumstances as in the diseases already considered, viz., impurity of the blood from imperfect elimination. The obstruction to the circulation in the kidneys which arises during the progress of the disease may also, in some degree, contribute to the result. I have rarely heard patients complain of uneasiness from cardiac hypertrophy, but have often found it distinctly indicated by physical signs during life.

2d, Affections of the Lungs and Bronchi:—

(a) *Congestion and Œdema* are common in this disease. In more than half of my cases they were well marked. Sometimes coming on suddenly, they simulate an attack of acute bronchitis. Whether coming on suddenly or insiduously, they are frequently the cause of death.

(b) *Pneumonia* was present in 7 per cent of my cases, and in these it no doubt contributed to, if it did not actually induce, the fatal result.

3d, Inflammation of Serous Membranes.—Pleurisy was observed as a recent lesion at the time of death in 15 per cent of my cases, pericarditis in 7 per cent, peritonitis in none. In the cases in which these affections were present the renal malady was generally well advanced, and it appeared that the complication had been the cause of death. With regard to the probable mode of origin of these inflammations, it is unnecessary to add anything to what has already been said.

4th, Derangements of the Alimentary Tract.—In some cases post-mortem examination reveals signs of chronic inflammation of the gastric mucous mem-

brane, affecting both the tubes and the intertubular substance. Dr Fenwick remarks,¹ that the granular kidney and other chronic forms of Bright's Disease are most associated with intertubular gastritis, while the acute renal affections are accompanied by disease of the follicles. Dr Wilson Fox confirms these observations. Dyspeptic symptoms are commonly urgent and distressing. Thirst, feeble digestion, acidity, and flatulence are often complained of.

5th, Diseases of the Brain.—Sanguineous apoplexy is a more common cause of death in this than in any other renal malady. It was present in 15 per cent. of my series of cases, and in most of them it had led to the fatal result. Most common in the advanced stages, it may be due in part to the altered state of the blood, in part to the increased force of the hypertrophied heart, and in part to the degeneration of the vessels which so frequently accompanies the disease.

6th, Affections of the Eyes have long been recognised as occasional complications of albuminuria. Although occasionally met with as complications of the other forms, they are so much more common in this variety as to be almost entitled to be regarded as a diagnostic feature. The experience of all observers confirms this. Dr Badar,² for example, says, that "granular kidney, with dilatation of the cavities of the heart, and hypertrophy of the left

¹ The Morbid States of the Stomach and Duodenum, p. 178.

² The Natural and Morbid Changes of the Human Eye, by Charles Badar, Ophthalmic Assistant-Surgeon to Guy's Hospital, 1868, p. 464.

ventricle, have been found, not in all, but in most cases in which post-mortem examination could be obtained." And, in another place, he remarks that the renal symptoms preceding the ophthalmic are often so slow in progress and slight in degree as to escape notice. There are two morbid conditions of the eye which deserve attention.

(a) *Uræmic Affection* is comparatively rare. Von Græfe³ observed it in 2 out of 32 cases of impaired vision with albuminuria; Dr Badar observed it in 6 out of 38 cases. The patient becomes rapidly blind; remains so for a shorter or longer period, and then quickly recovers. The attacks frequently recur. The ophthalmoscope reveals no morbid appearance. Vision, though unaffected after the first attack, fails gradually when other nervous symptoms have been superadded.

(b) *Neuro-Retinitis and its consequences*.—The impairment of vision caused in this way is less sudden in its occurrence, and progresses gradually. Very seldom does absolute blindness ensue,—the patient complains of a mist enveloping objects, while black spots, and sometimes sparks of light, are observed before the eyes. The appearances revealed by the ophthalmoscope are like those of ordinary neuro-retinitis, but with a tendency to involve the macula lutea, and the retina between it and the optic disc. At first there is congestion of the retinal veins and cloudy swelling of the tissues. Hemorrhagic spots are almost invariably

³ Quoted by Dr Argyll Robertson, Ed. Med. Journal, Jan. 1871.

present. Very soon bright glistening whitish yellow spots appear at the macula lutea, in the form of lines radiating from the central point, and a similar change occurs in the retina around the entrance of the optic nerve, forming a sort of mound. The spots have a tendency to coalesce and form larger patches. Their anatomical character has been closely examined by Schweigger and others, and the white patches and lines have been found due to the affection of the radiating fibres of Müller, which at the macula are placed obliquely, and radiate from the central point. The change consists in an exudation into, followed by fatty degeneration of, the connective tissue and other elements of the retina. The hemorrhagic spots are due to the rupture of small blood vessels. The nerve structures of the retina also become sclerosed, and, according to Schweigger and others, distended with serum. The vessels are sometimes fatty.

This affection is very characteristic of the cirrhotic disease, and is by no means seldom the first symptom to attract attention. Dr Argyll Robertson⁴ has recorded a number of cases in which the diagnosis of Bright's Disease was established by the eye symptoms alone, and in all these cases the disease of the kidney was advanced, although the renal had not attracted attention. The prognosis in respect of Bright's Disease must be held to be very unfavourable when the eye symptoms have appeared. As to the eye, also, the prog-

⁴ Albuminuric Retinitis, by Dr Argyll Robertson. Ed. Med. Jour., Jan. 1871.

nosis is bad, although Von Græfe⁵ observed in three patients the white patches disappear, and the sight return.

Some authors, as Traube, have sought to refer the disease to arterial tension caused by hypertrophy of the heart, but this can scarcely be the true explanation, as it has been met with when the heart was unaffected.⁶

7th, Affections of the Blood.—In the more advanced stages of the disease there is obvious anæmia, and a condition corresponding to that described as occurring in the renal affections already considered.

8th, Hemorrhage.—In advanced stages hemorrhage is a common and sometimes a dangerous symptom. I have seen it from the nose, mouth, bowel and uterus. Dr West⁷ remarks that menorrhagia frequently occur along with granular kidney, and recommends that in cases of that disease the urine should be carefully examined.

(b) *Concomitant Complications.*

1st, Affections of the Liver.—The most common change is cirrhosis, which may be more or less marked. It was present in 15 per cent. of my cases. Fatty degeneration occurs in nearly the same proportion.

⁵ Quoted by Dr Argyll Robertson.

⁶ Soelberg Wells on Diseases of the Eye, p. 342.

⁷ Lectures on the Diseases of Woman, 3d ed., p. 48.

2d, Affections of the Spleen.—Thickening of the capsule and increase of the fibrous stroma commonly co-exist with cirrhosis of the kidney. They were present in about 40 per cent. of my cases.

3d, Affections of the Blood Vessels.—Atheroma of the aorta and the systemic arteries generally occurs as a concomitant, or perhaps a consequent, complication. We find it in all its stages, from the mere sclerosis of the inner coat to fatty disintegration and calcareous impregnation.

Tubercle of the Lungs is often met with in cases of this form of Bright's Disease, but phthisis is so common in this country that it is difficult to determine whether it is merely a casual complication, or in some way related to the renal malady.

CHAPTER XVII.

THE CIRRHOTIC OR CONTRACTING FORM.

CAUSES.

THE name Gouty Kidney is a sufficient indication of the frequent co-existence of this disease with gout. Dr Todd,¹ who published an able Lecture on the subject, remarks that, while this malady may occur in other states of the system, it is peculiarly apt to be developed in the inveterate gouty diathesis. He describes several well marked cases, and points out how well their history comports with the humoral view of the pathology of gout. Dr Garrod also describes cases of this kind in his work on Gout. I have frequently met with cases in which these maladies co-existed, but have also not unfrequently seen the renal disease independent of gout. On the other hand, I have seen one and known of other well marked cases of rheumatic gout in which the kidneys were waxy; and again, I have seen gout accompanied by inflammatory Bright's Disease.

With regard to the mode of action of the gouty poison in inducing this state of the kidney, Dr Todd

¹ Clinical Lectures on certain Diseases of the Urinary Organs, and on Dropsies, by Robert Bently Todd, M.D., p. 313.

remarks that such a condition as this may be easily produced by a tainted nutrition. The blood, charged with the morbid matter of gout, furnishes to the kidneys an unhealthy pabulum, which, while it undergoes changes analogous to those which occur in health, does so in a very imperfect way, insufficient to maintain the nutrition of the healthy tissues of the gland. This, he thinks, explains the shrinking of the organ; the altered circulation would lead to the albumen in the urine, the want of epithelium to its pale colour and low specific gravity. This theory, although ingenious, can scarcely be accepted as a solution of the question.

We are indebted to Dr Garrod for the observation that the *introduction of lead into the system* favours the occurrence of gout and of the cirrhotic kidney,² His observations have been amply confirmed by other observers, among whom may be mentioned Dr Warburton Begbie³ and M. Charcot.⁴

M. Olivier⁵ found, in a series of cases occurring in workers in lead, who were neither addicted to drinking nor cachetic, that albumen was present in the urine. Sometimes it was merely temporary, sometimes more persistent. When temporary, he conceived that it resulted from the irritation of the lead passing through the kidneys. When permanent, he

² Garrod on Gout.

³ Edinburgh Medical Journal, August 1862.

⁴ Gazette Hebdomadaire, 1863, No. 10 et 27.

⁵ Archives Générales de Médecine, 1863-4.

believed it to result from degeneration of the renal tissues consequent upon the deposition of lead within them.

Lancereaux⁶ found granular kidneys in several cases which he examined. I have carefully observed several cases in which Bright's Disease co-existed with lead poisoning, or occurred in workers in lead, and have found that this form of renal disease was the one from which they suffered.

Some writers are of opinion that *chronic congestion of the kidney from heart disease* leads to this form of renal affection. It is quite true, as Sir William Jenner⁷ pointed out, that chronic congestion leads to induration of organs. Such lesions may be constantly observed in the spleen and liver. I have also seen, as the effect of the same causes, induration, and less frequently a granular condition of the kidney. But the tubules were affected as much as, or even more than the fibrous stroma, the very reverse of what we see in true cirrhotic disease. In the earlier stages of cardiac disease, albumen not unfrequently appears in the urine, the result of increased blood pressure on the capillary walls; and, as a farther consequence, the tubules are blocked up with a fibrinous exudation. Some of this is discharged in the form of fibrinous casts, but a portion remains, and being gradually absorbed, leads to atrophy, corresponding to the amount of renal structure destroyed.

⁶ L'Union Médicale, 1863.

⁷ Medico-Chirurgical Transactions, vol. lxxiii.

When the congestion has existed long, the kidney undergoes induration, but the process appears to me to correspond to what is termed the spurious cirrhosis of the liver, which arises under similar circumstances.

Pregnancy has also been supposed by some authorities to lead to this affection, but I have not met with any cases confirmatory of the view.

Drunkenness is, in my experience, a very common characteristic of the victims of this form of renal disease; and although I have not been able to obtain statistical evidence on the point, I am satisfied that a close connection exists between cirrhosis of the kidneys and intemperate habits.

CHAPTER XVIII.

THE CIRRHOTIC OR CONTRACTING FORM.

TREATMENT.

THIS is the most hopeless of all the forms of Bright's Disease in relation to treatment, for we have no means of curing the renal disease, and it is even doubtful whether we can check its progress. The remedies available for the alleviation of symptoms are also uncertain in their action.

But while this is true, the physician can do much for his patient by removing, curing, or diminishing the conditions which are known to cause and aggravate the disease, by relieving the symptoms which arise in its course, and by obviating or treating the complications as they occur.

Among the causes, we have already seen that *gout* is entitled to occupy a prominent position, and in many cases its treatment is as important as that of the renal affection itself. The patient must be encouraged to take sufficient out-door exercise, but exercise short of fatigue. Riding may be specially recommended to those whose circumstances admit of it. The patient must also be careful to avoid excessive mental work; and this can best be managed in

the case of busy men by sending them to watering-places, or to travel. The diet must be nourishing, but not stimulating, containing a fair quantity of animal food, and a considerable proportion of vegetables. With regard to wines, claret and hock should be preferred, while the heavy, the sweet, and the sparkling varieties should be avoided. If stimulants be required, brandy or other spirit may be given, but should be well diluted, and partaken of sparingly. Potash or lithia water may be taken with advantage ; soda is less suitable, for uric acid, which is in excess in the blood, forms with potash a soluble, with soda an insoluble salt. Of medicinal remedies, the most valuable are colchicum and alkalies—such as potash and magnesia. In gouty cases, tonics are frequently indicated, and much benefit may be derived from judicious hydropathic treatment.

When the renal affection depends upon the presence of *lead in the system*, our first aim must be to prevent further contamination. In the case of workmen—such as house-painters and plumbers—it is difficult to effect this, but we can warn them to be cleanly, to avoid eating in the midst of their work, and to keep away from those particular departments of work which are specially dangerous. We must further attend to the state of the bowels, and endeavour, by medicines, to prevent the absorption of lead, to get it out of the system, or to render it inert. Iodide of potassium may be given with a view to the formation of iodide of lead. Sulphuric acid also may

be employed in order to produce the inert sulphate of lead. It may be given in the form of acidulated lemonade, or simply with water.

In the treatment of the symptoms directly referable to the renal disease, little can be done to improve the condition of the urine. If its quantity become diminished, we obtain good results from diuretics. If the action of the skin be defective, diaphoretics and baths may be tried. If dropsy occur, it must be treated on the principles formerly explained, regard being always had to the impoverished state of the blood. If uræmic convulsions occur, bleeding or chloroform may be resorted to; the anæmia renders the latter agent preferable. Even in this condition tonics may be useful. The coronal headache frequently yields to ephedrine, which are also sometimes useful for the rheumatic pains in the limbs.

With regard to the complications, the pulmonary oedema and the acute inflammations should be treated on the principles previously indicated, but special caution must be exercised as to the employment of depletion, mercurials, or other lowering remedies.

The affections of the *primæ viæ* also frequently require patient management. When sickness and vomiting occur, ice and other gastric sedatives are useful. Strychnia, nux vomica, and other bitters, with or without iron, are very useful as tonics.

When the eyes are affected, all exertion and exposure to strong light must be avoided. The patient must not read, nor attempt to do any fine work.

Blue glasses should be worn to protect the eyes, and the gas burners should be furnished with blue shades. He should also avoid stooping and straining, which are apt to induce extravasation of blood. For medicinal treatment, iodide of potassium and purgatives are recommended. If the patient be strong, and free from anæmia, small doses of mercury may be beneficial. When the eye affection has become chronic, blisters may be applied to the temples, and chalybeate tonics are of special value. Mr Soelberg Wells¹ states that the only local application which he has found useful is the artificial leech; and in cases in which from the anæmic condition of the patient he deems it unadvisable to abstract blood, he applies the dry cup to the temples, repeating the operation every five or six days. He has frequently seen marked benefit result from this plan.

In cirrhosis, as in other forms of renal disease, the strength must be supported by nourishing diet, and by iron. All care must be taken to avoid exposure to cold, and residence in a warm climate is eminently beneficial.

¹ A Treatise on the Diseases of the Eye, by J. Soelberg Wells. London, 1869, p. 343.

CHAPTER XIX.

THE COMBINED WAXY AND INFLAMMATORY
DISEASE.

MANY cases of waxy disease are complicated with the inflammatory affection of the tubules, and much of the confusion which exists in the minds of medical men with regard to this disease is the result of their having failed to distinguish between cases of this kind and purely waxy cases. The history of such cases is in general a commingling of the characteristic features of the two. The following instances may suffice as examples of the class.

CASE XLV.—*Waxy degeneration ; acute nephritis supervening ; uræmia ; recovery ; recurrence of inflammation ; death.*—James Norval, a baker, aged 34, was admitted to the Royal Infirmary, under my care, on November 1st, 1866. The patient had generally been healthy, but led an exposed life, had at one time had chancre and a bubo, and was rather intemperate. He stated that he never suffered from renal symptoms until a few days before he came under my care. Four days before admission, he observed that his ankles were swollen, and as the dropsy increased, he came to the Infirmary. On admission, his legs and feet were œdematous, there was considerable ascites, and some degree of general dropsy. He complained of a shooting pain in the left lumbar region, and had frequent calls to micturition, the quantity passed at a time being small. It was of specific gravity 1013, its reaction acid, its colour smoky, and it contained one-third of albumen. It deposited a sediment, consisting of blood corpuscles, with gran-

ular, epithelial, and hyaline tube-casts. There was some œdema of the lungs. The pulse was 47 in the minute, the heart sounds natural. He was ordered diuretics, consisting of digitalis and bitartrate of potash. On the 3d his urine was 50 ounces, but the dropsy was increased. He was ordered to be dry cupped over the loins. On the 5th, his urine had increased to 100 ounces, but the amount of albumen was still large; the dropsy, however, was diminished. On the 10th, he injudiciously exposed himself to cold, and on the 11th, his urine was suppressed. The dropsy then increased, and he complained during the forenoon of severe frontal headache, and in the course of the day became comatose. Between seven and eight in the evening, he had a severe convulsion fit, and five fits occurred between that time and ten o'clock. He was then cupped over the kidneys to 10 ounces by my clinical assistant Dr J. W. Paton. Under this treatment he became conscious, and the flow of urine recommenced. At three o'clock, on the morning of the 12th, he had another fit, and complained much of headache. He was ordered a drachm and a half of compound jalap powder. On the 13th, he was somewhat better, the urine 52 ounces, of specific gravity 1012, containing one-half of albumen. The diuretics were resumed, and on the 17th, he passed 100 ounces of urine. On the 24th, the urine was 90 ounces, and dropsy being still considerable, he was ordered to have inhalations of the oil of juniper. On the 25th, the urine was 110 ounces. From this time the quantity of urine was considerable, but the dropsy continued. In the course of December, fatty tube-casts prevailed, the bloody casts having totally disappeared, and the epithelial and granular become rare. Early in January, punctures were made with needles in the legs and in the skin of the abdomen, and large quantities of fluid drained away. Under this treatment, followed by tonics, he improved, and became so well that he was able to abscond from the Infirmary in March. In December he again presented himself; was entirely free from dropsy; was passing, according to his own account, about the natural amount of water, but it contained some albumen.

March 26th, 1868.—Norval again presented himself at the

Infirmary. He stated that he had enjoyed very good health from the time he left the Hospital until January of the present year. During November, December, and January, he was employed in the General Post Office, and walked about twenty-five miles daily. In January he met with an accident that confined him to the house for a few days, and he lost his employment. Since that time he has been tramping about in search of work, and much exposed to vicissitudes of weather. About the 12th March, he noticed that his feet were swollen, and soon after his hands also became affected. The day before his admission he got wet through, and continued to wear his wet clothes till they dried. In the morning his eyelids were swollen, and the dropsy was much increased.

On the day of admission he passed 28 ounces of urine of a smoky colour, highly albuminous. On microscopic examination blood corpuscles, fatty epithelium, and hyaline, granular, and fatty casts were found. There was general dropsy. The tongue was furred and moist; the appetite was good. He complained much of thirst; the abdomen was distended with fluid. The voice was husky (as it had been for eleven years, probably from syphilitic disease). There were distinct signs of œdema of the lungs. He had a good deal of cough, and expectorated a watery mucus tinged with blood. There was a systolic cardiac murmur, loudest at the apex. The pulse was 60, firm and regular. He was treated by means of diuretics and other remedies, but the quantity of urine did not increase, while the dropsy steadily gained ground. He had no convulsions nor coma, but was affected with restless delirium for some days before his death, and died on April 4th, after expectorating a considerable amount of blood.

Autopsy.—Only the kidneys were examined. The body was dropsical. The kidneys were somewhat below the natural size, and much congested. The capsules were somewhat adherent, and the surface of the organs was granular, the cortical substance atrophied. The tubules of the cortical substance contained a large quantity of fatty matter, and many were filled with recent exudation. The vessels and small arteries were waxy.

Commentary.—I have selected this case as a typical example of the combined waxy and inflammatory disease. The patient was of a syphilitic constitution, and, though he was not aware of it, probably had symptoms of waxy disease long before the occurrence of the inflammatory attack, for which he first came under my care. That attack was very severe; and he would have died of uræmia but for the timely interference of my assistant. Even after the quantity of urine had risen to 100 ounces daily the dropsy continued, until it was mechanically removed by puncturing the skin. The quantity of urine remained high to the end of his first residence in the Infirmary, and probably it was excessive during the interval of comparative health which succeeded. On his return he was suffering from a new and severe attack of inflammation, and from the commencement I regarded the case as almost hopeless. The remedies which formerly saved his life were now powerless. His dropsy increased, and ultimately proved fatal. It is obvious that the inflammatory affection masked the waxy degeneration, and but for the syphilitic history and the polyuria it might not have occurred to us that waxy degeneration existed; as it was, a degree of uncertainty prevailed, because of his statement that his urine had never been excessive before he came under my care.

The treatment adopted was a combination of that which has been recommended for each of the two diseases from which he suffered. The value of blood

letting, purgatives, diuretics, tonics, and acupuncture were well shown in the earlier part of the history.

CASE XLVI.—*Combined waxy and inflammatory disease; constitutional syphilis; death from dropsy.*—Alexander Palmer, æt. 39, a miner, born in Edinburgh, resident in Canongate, was admitted to the Royal Infirmary, under my care, on the 20th of July 1869, complaining of dropsy. He had been ill for several years.

History.—The patient states that when he was nine years old he had a fever, and at the age of twenty he contracted constitutional syphilis. In 1863 one of his testicles was removed. He has lived freely, and been somewhat intemperate. For a considerable time (he cannot say how long) he observed that he made a considerable quantity of urine. In July 1868 the flow diminished, and he became dropsical. From this attack he recovered, and the urine again rose to high amount, but the dropsy recurred; and although it nearly disappeared again, it soon returned, and has continued. On November 12th his state was as follows:—His complexion was pasty, and he was anasarcaous.

Alimentary system.—Teeth good; tongue slightly furred at the back; appetite poor; he vomits occasionally; the bowels are constipated; the abdomen is distended with fluid. The liver appears to be of normal size.

Circulatory system.—Natural, except that the first sound of the heart is prolonged.

Respiratory system.—Normal, excepting that the breathing is difficult, and that moist rales accompany the respiratory murmur.

Integumentary system.—There is general anasarca. There are a few cicatrices on the legs.

Blood system.—Natural.

Urinary system.—He has occasional pain in the loins and in the urethra. He passes water five or six times in the twenty-four hours. The quantity varies from 24 to 31 ounces daily. The

colour is pale; sp. gr. is 1015; reaction acid; and it is loaded with albumen.

Nervous system.—Natural, excepting that the sight is impaired, and that he is sleepless.

He was ordered iron, with diuretics and purgatives.

Nov. 18th.—The dropsy continuing, the penis and scrotum were pricked.

Nov. 25th.—A large quantity of serum has drained away. The urine has increased from 18 ounces to 36 daily.

Dec. 1st.—Patient worse to-day. He thinks he caught cold last night. The pulse is 120. The urine 32 ounces.

Dec. 3d.—On account of ascites the abdomen was tapped to-day.

Dec. 4th.—A large amount of fluid has drained away. At 2 A.M. patient had a severe attack of dyspnœa. The urine is 16 ounces.

Dec. 8th.—The dropsy is still great. The dyspnœa and exhaustion has gradually increased.

Vespere.—The patient gradually sank, and died between 9 and 10 this evening.

Autopsy.—The abdomen was much distended, and there was much œdema of the whole body.

Thorax.—There was a quantity of serum both in the cavity of the pericardium and of the pleuræ.

Heart.—The valves were all competent. There was general hypertrophy of the organ, especially of the left ventricle. None of the cavities were dilated. The substance of the heart was rather pale in colour.

Lungs.—The left lung was slightly compressed, and both were congested at their bases; otherwise they were healthy.

Abdomen.—The liver was at many points adherent to the diaphragm and neighbouring viscera. It was contracted in various places; showed marks of cicatrices. On cutting into the organ it was found to be rather congested, but otherwise apparently healthy. The organ showed the characteristic waxy reaction with iodine.

The *Spleen* was enlarged and congested, but not waxy.

The *Stomach*, towards its pyloric end, was coated with mucus; otherwise it appeared healthy. It gave no reaction with iodine.

Intestines.—There was congestion and slight extravasation of blood in the cœcum and beginning of the ascending colon. The lower part of the ileum gave a slight waxy reaction with iodine.

Kidneys.—The organs were of fully the natural size; the surface slightly granular and uneven; the capsules stripped off readily, On section the cortical substance appeared atrophied towards the surface. Many of the tubules were occupied by sebaceous looking material. The vessels presented the characteristic waxy appearance and reaction with iodine.

Commentary.—In this case there was no difficulty in establishing a diagnosis of combined waxy and inflammatory disease. The history of constitutional syphilis, followed by excessive flow of urine, clearly indicated the former malady—the dropsy and diminution of urine which succeeded afforded evidence of the latter. Although he twice threw off inflammatory attacks, it always recurred, and the prognosis was from the first rather unfavourable, even in respect of temporary improvement; but in November he did get somewhat better. A very slight exposure to cold, however, sufficed to aggravate his symptoms, and he died in consequence of dropsy affecting the lungs as well as the subcutaneous tissue.

CASE XLVII.—*Combined waxy and inflammatory disease; history of strumous abscesses; persistent diarrhœa, due to waxy degeneration of intestine, &c.*—Isabella Hannah, æt. 24, single, servant, born at Glasgow, and resident at Stirling, was admitted to

the Royal Infirmary, under my care, June 18th, 1870, complaining of swelling of the legs, which has existed for about a year.

History.—Patient has never been very strong, but has had no illness before the present attack, with the exception of an abscess in the left side of the neck several years back, the extensive cicatrix of which is present. Her food has sometimes been rather scanty. She has been of temperate habits, and her general surroundings have been good. The present illness commenced a year ago, when she says she caught cold, and her legs began to swell. Soon after she noticed that she required to pass her water much more frequently, though she passed very little each time, and thinks the total amount was small. She was obliged to desist from her employment, and rest herself, and soon the dropsy almost disappeared, but last November she again became dropsical, and the œdema has never since entirely disappeared. *Family history.*—Her mother died of phthisis.

State on admission.—Her complexion is pale, the cheeks, however, being somewhat flushed; her general appearance is that of a well-nourished but strumous young woman. Temperature 100°.

Alimentary system.—Her teeth and gums are good; her tongue clean; her mouth is often dry, and with a disagreeable taste in it in the morning. Fauces and deglutition natural. She has a poor appetite, and a good deal of thirst, and complains of acid eructations after her meals; her bowels have been loose for the last six weeks. On palpation of the abdomen there appears to be some ascites, but it cannot be made out for certain on account of the œdema. The circumference of the abdomen is 34 inches round the umbilicus. The liver measures $4\frac{1}{2}$ inches superficially in the mamillary line. There is considerable œdema.

Circulatory system.—Normal. The pulse is 84, regular, and of fair strength.

Lymphatic and blood system.—The lymphatic glands of the neck on the left side are enlarged. The microscopical appearance of the blood is natural. There is no enlargement of the spleen.

Respiratory system.—There is well-marked dullness under the

left clavich, and at the same point the expiration is somewhat prolonged, the character harsh, with coarse crepitation, and the vocal resonance a little increased. Under the right clavicle the expiration is prolonged, and there are occasional sonorous rales, and the vocal resonance is natural. She has for two months had a dry, painful cough, always worse at night.

Integumentary system.—The skin is hot and dry, and there is cedema of the whole body. In the neck a cicatrix of an old abscess is observed along the course of the sterno-mastoid muscle and along its clavicular attachment.

Urinary system.—Occasionally patient experiences pain in the lumbar region. The urine is 34 ounces in amount during the past 24 hours; it is acid in reaction; its sp. gr. is 1021; and it is albuminous. There is a deposit which contains hyaline and granular tube-casts.

Reproductive system.—Patient has not menstruated for the past 12 months.

Nervous system.—Normal.

Treatment was mainly directed towards checking the excessive diarrhoea, but without effect. Vomiting was also frequently distressing. The urine rose to fully the normal amount, but the anasarca did not disappear. The patient's strength gradually diminished, and she died in the beginning of August.

Autopsy.—The body was well nourished.

Thorax.—The heart was small but healthy. The right lung was adherent at the apex, and also to the upper surface of the diaphragm. It was diminished in volume, cedematous, congested, and the bronchi were much inflamed. The left lung was also diminished in volume, and presented traces of old tubercle (cretaeous deposit) at the apex. The other parts of the lung were congested and cedematous. The bronchi were much congested.

Abdomen—Liver.—Its upper surface was firmly adherent to the diaphragm. The organ was rather fatty, and did not give the characteristic waxy reaction with iodine.

The *Stomach* presented numerous hæmorrhagic patches at its cardiac end.

The *Spleen* was enlarged. It was distinctly waxy.

The *Kidneys* were enlarged, each weighing 8 ounces. The tubules were loaded with fatty matter; the small arteries and malpighian bodies presented the appearances and reaction of waxy degeneration.

The *Intestines* were also waxy.

Commentary.—I regretted that during the last month of her illness I was seldom able to see this patient. The diagnosis of combined waxy and inflammatory disease was established soon after her admission. The evidence of the inflammatory affection was very obvious,—the dropsy, the diminished flow of urine, and the tube-casts all indicating it. The circumstances which led me to conclude that the waxy degeneration was also present, were the history of abscess in the neck, the evidence of tubercular disease, the constant watery diarrhœa, and the fact that the quantity of urine rose to its natural standard without the dropsy being relieved. The diarrhœa was ascribed to waxy degeneration, and the post-mortem examination demonstrated the correctness of this opinion.

CHAPTER XX.

COMBINED CIRRHOTIC AND INFLAMMATORY
DISEASE.

PARTICULARLY in the later stages of the cirrhotic disease, inflammation of the tubules is apt to supervene. In not a few cases, indeed, renal disease is not detected until the sudden occurrence of the prominent symptoms of nephritis draws attention to the condition. The following narratives may suffice as examples. The first is the further history of a man whose earlier symptoms are described as an instance of cirrhosis. In the former account I showed that under treatment he improved, and was able to leave the Infirmary.

CASE XLVIII.—*John Stewart's history continued.*—*Cirrhotic kidney; supervention of inflammation; death.*—The patient was re-admitted to Ward VI., under my care, on the 25th May 1868, five days after his dismissal. After leaving the Hospital he seems to have gone straight off and entered on a debauch. He re-appeared in a wretched state, without his boots, and with severe rheumatic pains in his ankles, knees, and elbows. He was ordered colchicum and alkaline diuretics.

May 26th.—Very ill. Complains of intense thirst. Ordered to take a table-spoonful of lemon-juice in water now and then. Urine acid, very albuminous and smoky—sp. gr. 1009. Quantity not ascertained, but on the days immediately following it was found to be—

<i>May 27th,</i>	.	.	.	.	.	84 oz.
„ 28th,	.	.	.	.	.	94 „
„ 29th,	.	.	.	.	.	104 „
„ 30th,	.	.	.	.	.	68 „
„ 31st,	.	.	.	.	.	60 „

June 1st.—Last night the patient began to suffer from considerable difficulty of breathing. Urine diminished in quantity to 54 oz. It is of a smoky hue, and contains blood corpuscles. On heating it, and adding nitric acid, a deposit of albumen forms to the extent of one-half. There is considerable œdema of the walls of the chest and of the loins, and to a slight extent of the lower extremities. He complains of no pain over the region of the kidneys. He does not sleep at night, and is very restless. There is no headache, and the pulse is of moderate strength. To-day he was ordered 2 drachms of compound jalap powder, and a diuretic mixture.

Vespere.—About an hour after the administration of the purgative the patient had four or five copious liquid evacuations, which considerably relieved the oppression under which he laboured. There is still considerable difficulty of breathing, and an anxious expression. There is no dullness on percussion anteriorly or posteriorly, but over all the chest loud sibilant and sonorous rales are heard. He was ordered to have turpentine stupes applied over the chest.

June 2d.—Did not sleep well at night, although the breathing was considerably relieved by the turpentine stupes. The bowels have been frequently moved since last night, but little has been passed. The patient complained of hemorrhoids. The urine is diminishing in quantity, and its hue is darker, from increase of blood. Quantity 53 oz.

June 3d.—Patient says he does not think he is any worse. His breathing is still oppressed. The turpentine stupes were repeated last night. Bowels have been often moved, but little passed. The urine is considerably diminished in quantity, and is of a redder colour. It contains numerous blood corpuscles and bloody casts.

Vespere.—Had turpentine stupes applied over his loins in the afternoon. Was dry-cupped over the loins, and ordered to have a hot-air bath.

June 4th.—Patient slept a little last night. The hot-air bath caused copious perspiration. The urine is steadily diminishing in quantity, and looks much more bloody than before. Quantity 24 ounces. To-day he was ordered another dose of compound jalap powder.

Vespere.—The patient's bowels have been moved once or twice. Ordered to have the hot-air bath, and to be dry cupped.

June 5th.—Urine not measured, as patient did not pass any except when at stool. The breathing is much the same as before. Ordered to have turpentine stupes applied. He was also ordered to inhale 30 drops of oil of juniper occasionally, and to have the hot-air bath repeated to-night, as it did not act last night, though kept up for a considerable time.

June 6th.—Sibilant and sonorous sounds, with mucous rales, accompany the respiration all over the chest. There is no dullness anteriorly, but posteriorly there is dullness over the base of the lungs. He complains of a pain in the abdomen on each side, corresponding to the course of the ureters. He slept a little last night. The hot-air bath caused copious diaphoresis. He makes water only when at stool, and in very small quantity. He says he does not feel worse, but rather easier. He does not complain of headache; and seems always inclined to dose. There does not seem to be any obtuseness of the mental faculties, but his face has a very anxious expression.

June 7th.—Patient had the hot-air bath this morning, and perspired a good deal. His urine is a little increased in quantity, but still cannot be measured, as it is passed chiefly at stool. There is no headache, but the same anxious expression, and great difficulty of breathing.

June 8th.—Patient to-day looks worse than yesterday. His mental faculties are getting obtuse. He says he feels rather "queer," but cannot further describe his sensations. He complains of headache. He passed a very restless night, and appeared to be

rather delirious. His urine is almost suppressed. Before the visit he had the hot-air bath, but it seemed to excite him, according to the nurse's statement, and it was accordingly discontinued. He was ordered turpentine stupes over the chest, also a purgative of compound jalap powder.

Vespere.—Patient is comatose. His motions are passed in bed. He cannot be roused, and his pupils are insensible to light. His respirations are stertorous and gurgling—36 in the minute. His pulse is full—78 in the minute. His skin is moist and warm. The present change came on about 5 P.M., after an attack of vomiting. The patient died, comatose, at ten minutes to ten o'clock.

Autopsy.—The body was dropsical. The abdomen alone was examined, and more particularly the kidneys. The peritoneal cavity contained a considerable quantity of serous fluid. The liver appeared to the naked eye slightly cirrhotic. Under the microscope many of its cells were found to be fatty, and the fibrous stroma was somewhat increased. The right kidney weighed 4, the left 5, ounces. In both the cortical portion was diminished relatively to the cones. The cortical substance was congested, and contained many small cysts. The capsule was slightly adherent. The surface was granular and greyish in colour. The spleen was pulpy, congested, and friable. The bladder contained about 2 ounces of urine. On microscopic examination of the kidneys, the connective tissue was found much increased, and the substance atrophied towards the surface. The epithelium was cloudy and granular, and many of the remaining tubules were blocked up by exudation,—in some parts recent, in others of older standing, and fatty. There were also numerous points of extravasation throughout the cortical substance.

I have selected this case as a typical example of the combined cirrhotic and inflammatory diseases. Up to the time of his leaving the Hospital the patient had exhibited no symptom of inflammation of the tubules; but when, in the course of his debauch, he

was exposed to the weather, such inflammation was lighted up. It appeared that the pre-existing disease rendered fruitless our efforts to relieve the tubules, and the patient gradually became worse, and died a fortnight after his return. Had we not known that cirrhosis existed in his kidneys we could not have diagnosed anything, excepting the inflammation, after it had been established. The only consideration which might have guided us to such an opinion was the fact that the symptoms were more severe than the amount of inflammation seemed to warrant. The case shows how serious a complication inflammation proves when superadded to cirrhotic disease of the kidney.

CASE XLIX.—*Combined cirrhotic and inflammatory disease; death from dropsy.*—William Stewart, æt. 42, widower, brick-maker, born at Kelso, resident at Musselburgh, was admitted to the Royal Infirmary, under my care, January 15th, 1870, complaining of dropsy of the whole of the body, diminished secretion of urine, and slight cough. He had been ill for three weeks.

History.—Patient was always a healthy man until the present attack. His habits as to food and drink have been good, and his general surroundings have been favourable, except that he has been much exposed to changes of weather while at his work. The present illness commenced about three weeks ago, with severe shiverings and pain in the head, followed in a day or two by swelling of the ankles, the swelling gradually extending upwards and involving the scrotum, abdomen, and the face. This swelling was accompanied or preceded by a diminished flow of urine. The swelling has gradually been increasing until his admission into the Infirmary. His family history is unimportant.

State on admission.—Patient is a strong and well-built man, with a pale sallow complexion.

Alimentary system.—The teeth and gums are natural; the tongue is covered with a whitish fur in the centre; the secretions of the mouth are natural, as is also the deglutition. His appetite is very bad, and has been so since the commencement of the illness. There is no flatulence, nor gastric pain or uneasiness, nor any vomiting. The bowels are confined. The abdomen is much enlarged; it measures 42 inches at its most prominent part. It is tympanitic on percussion anteriorly, but dull in the lateral regions, the line of dullness varying with the position assumed by the patient. The liver measures $4\frac{1}{2}$ inches superficially in the mammillary line. No tumour can be felt in the abdomen.

Circulatory system.—Normal. The pulse is 80, full, and quite regular.

Blood and lymphatic system.—Normal.

Respiratory system.—Normal.

Integumentary system.—There is very considerable oedema over the whole surface of the body. The skin is dry, and presents no trace of any eruption.

Urinary system.—There is no lumbar nor vesical pain. The quantity of the urine passed during twenty-four hours is 55 ounces; it is of pale colour, and acid reaction; its sp. gr. is 1015; and it contains a large quantity of albumen. There is a slight deposit, which is found to contain tube-casts.

Nervous system.—Normal.

Treatment.—Ordered to have a purgative, and to take spirit of juniper.

Jan. 20th.—No diminution of the oedema has occurred. The quantity of the urine is 40 ounces. He was ordered to-day to take a drachm of the compound jalap powder, and to have the following mixture:—

R. Tinct. Ferri perchlor. ʒij.
 Sp. Eth. nitrosi ʒjs.
 Tinct. Scillæ ʒii.
 Tinct. Digitalis ʒij.
 Inf. scoparii ad ʒvj.

Misce.

Sig. A table spoonful to be taken three times a-day.

Jan. 21st.—No purgative action followed the administration of the compound jalap powder. The œdema has much increased. He is ordered to have a drachm and a-half of the compound jalap powder, and to be dry cupped over the kidneys. The mixture to be continued.

Jan. 22d.—Patient vomited the powder soon after it was taken; and no action of the bowels occurring, he was ordered an enema containing castor oil and turpentine. The urine amounts to 57 ounces, and the albumen is not so abundant.

Jan. 24th.—The œdema is increasing, but the quantity of water he passes is larger. Pulse 86. There is some dyspnœa; and on auscultating the lungs posteriorly, the expiration is prolonged. The character of the breathing is marked by the accompaniments, which are soft snoring rales with moist crepitations. Ordered to have turpentine stupes applied to the back of his chest. The diuretics to be continued; and, as the constipation still persists, he is to take a drop and a-half of croton oil.

Jan. 25th.—The croton oil produced several watery stools. The face is not so swelled, but the œdema is greater in the legs and feet. The quantity of the urine is 53 ounces. The pulse pretty strong. The serotum is to be pricked, as it is much distended with œdema.

Jan. 26th.—The dyspnœa has been very troublesome, and caused him to pass a very bad night. The œdema is no less. Dry cupping to be applied over the regions of the kidneys. The pulse is pretty strong, and the bowels are freely open.

Jan. 27th.—Patient lies on his left side in a torpid condition. The swelling of the face is considerable, but more marked on the left side. The swelling of the serotum is less, but that of the legs remains the same. The amount of the urine collected is 55 ounces, but he has passed some in bed—it contains a large quantity of albumen. The breathing is hurried, the respirations being 36 per minute, and on both sides of the chest loud sibilant and snoring rales can be heard. The pulse is 92, of fair strength, but somewhat irregular. Ordered to be dry-cupped over the back of the chest, and to be wet-cupped over the kidneys, and to have a

stimulating expectorant mixture, containing carbonate of ammonia, ipecacuanha, squills, and senega.

Jan. 28th.—The cups were applied over the kidneys, and four ounces of blood abstracted. Patient slept better last night. He has changed his position to the right side, and still lies in a torpid state. The œdema of the hands and feet and face is greater, the eyelids being completely closed. The amount of urine could not be ascertained, as he passed most of it in bed. The dyspnœa still continues, the respirations number 39 per minute, and loud snoring rales are still present. The pulse is 104, weak and irregular. Death took place next morning.

Autopsy.—There was very great œdema of the whole body.

Thorax.—The heart was much hypertrophied, weighing 1 lb. 7 oz.; valves were all healthy, except that the aortic valves were slightly thickened and incomplete, appearing as if they were perforated. There was a large decolorised clot in the right ventricle, and also one in the left ventricle.

Lungs.—There were slight adhesions of the left lung at the base. Both lungs were œdematous and congested, especially the right.

Abdomen.—The liver was strongly adherent to the diaphragm by its upper surface; it was much enlarged, and weighed $4\frac{3}{4}$ lbs. On section the organ presented a firm clean cut surface, which gave a slightly waxy reaction with iodine.

The *Spleen* was firmly adherent to the intestines, and on section it was found to be congested and pulpy.

The *Kidneys.*—On the surface of the right kidney there was a cicatrix; the capsule was slightly adherent. On section the surface appeared pale, the pyramids were not well seen, and the whole kidney appeared contracted. It gave no reaction with iodine. It weighed $4\frac{1}{4}$ ounces. On section many of the tubules were found full of sebaceous looking material. On microscopic examination much fatty degeneration of the epithelium was seen, the tubules being occluded. The left kidney presented similar characters, but was larger than normal; it weighed $7\frac{1}{2}$ ounces. On microscopical examination it was also found to be fatty.

Commentary.—The patient had no idea that he had been ill prior to the commencement of the inflammatory attack which proved fatal, but the course of his case led me to suppose that the inflammatory affection was merely superadded to a pre-existing cirrhosis. This was suggested by the appearance of the patient, and by the fact, that although the quantity of urine increased, there was no corresponding improvement in the symptoms. This circumstance pointed to some chronic process; and while there was full evidence that that was neither inflammatory nor waxy, there was nothing opposed to the idea of its being cirrhotic. The post-mortem examination revealed the combined diseases, as had been anticipated. I regret that in the treatment I did not aim more persistently at the establishment of diaphoresis, which I would certainly do were I to meet with another case of the kind.

CHAPTER XXI.

ON THE DIFFERENTIAL DIAGNOSIS OF THE
DIFFERENT FORMS AND THEIR COMBINATIONS.

IN the preceding pages I have sought to show in outline the characteristic features and the appropriate treatment of the three diseases which bear the name of Bright. Many points have been passed over, being regarded as matters not essential to such an account as I aimed at giving. Among these I may refer to such exceptional conditions as the occasional occurrence of the different forms without albuminuria, and inflammation affecting only one kidney, and thus inducing a series of anomalous symptoms.¹ I propose to devote a concluding chapter to an outline of the grounds for the establishment of a differential diagnosis of the different forms and their combinations.

In attempting to establish such a differential diagnosis we are mainly guided by four groups of facts, viz., the History of the Patient, the Amount and Character of the Urine, the Presence or Absence of Dropsy, and the Complications.

¹ See Harley on Albuminuria, p. 20.

I. THE HISTORY.

(a) *Of previous illnesses.* If a patient suffering from Bright's Disease has just recovered from scarlatina, erysipelas, pneumonia, or other acute disease, the probability is in favour of the Inflammatory form. If he has previously been affected with syphilis, caries, chronic suppurations, or other wasting malady, there is a strong probability in favour of the Waxy form; if he have suffered from gout or lead-poisoning, there is a probability in favour of the Cirrhotic.

(b) *Of the present illness.* If the malady has commenced suddenly with dropsy, diminution of urine and fever, or if it has come on gradually with dropsy and diminution of urine, we have to suspect the existence of Inflammation. If it commenced insidiously, with increased flow of urine, the Waxy is generally indicated; if it commenced insidiously, with no symptom attracting attention until a sudden uræmic convulsion or dimness of vision appeared, the Cirrhotic is almost certainly indicated.

It is often very difficult to elicit a true account of the History of patients, for there are circumstances which they may wish to conceal—such as having been affected with syphilis; or which they may overlook—such as having suffered from mild scarlatina, and the early symptoms are in many cases very obscure. More frequent or more copious micturition may scarcely have attracted attention; and the

long continuance of symptoms may make them appear to the patient simply the natural state.

It must never be forgotten, too, that one form of Bright's Disease is often superadded to another, and the discriminating physician must carefully inquire into the History in order to determine whether this has been the case in any individual instance of disease. It is of very great importance in prognosis, for example, to determine whether a cirrhotic process has preceded an inflammatory, the inflammatory having been the first to attract the attention of the patient; or whether waxy degeneration has preceded inflammation in cases in like circumstances.

II. THE URINE.

(a) *Quantity*.—In the first stage of the inflammatory form the Urine is almost always diminished; in the second stage it is often diminished, but sometimes natural; in the third stage it may be diminished or in natural quantity, sometimes it is increased. Even when the quantity is low, the calls to micturition may be frequent, the amount passed on each occasion being small. An increased secretion of urine characterizes the waxy disease from its earliest stages. I have more than once seen it even before the albumen appeared, and have found it continue throughout the whole course of the case.

The increase may not be present even in waxy

cases when the inflammatory affection is superadded to it. The quantity may in such instances be diminished. The quantity may also be reduced to its natural amount when severe diarrhœa drains large quantities of water from the system. In the earlier stages of cirrhosis the quantity of urine appears to be normal; in more advanced stages it is often excessive, sometimes reaching 100 to 150 ounces in the day.

(b) *The Colour and Appearance.*—In the early stages of the inflammatory form the urine is usually dark in colour, often smoky or distinctly coloured with blood. In more advanced stages it is usually free from the smoky or bloody appearance, is sometimes pale and limpid, throwing down scarcely any deposit. In the waxy or cirrhotic forms it is usually pale, being only in rare cases bloody, and seldom so dark in colour as normal urine.

(c) *The Density.*—The specific gravity of the urine corresponds in most cases to the amount, but sometimes it is very low even when the amount is scanty. It is generally lower in the chronic forms than in the acute.

(d) *Amount of Albumen.*—In the inflammatory form, throughout its whole course, albumen is copious; sometimes it may be so abundant as that the urine becomes solid on boiling and applying nitric acid. In very rare cases albumen may be absent altogether. In the other forms it is usually less copious, sometimes entirely absent. In the cirrhotic form I have often

seen the albumen, even in advanced stages, small in quantity.

(e) *The Tube-casts and other Deposits.*—The only deposits of much importance are blood and tube-casts. The former may occur in any of the forms; but is by far most common in the early stage of the inflammatory. Some authors attach great importance to the tube-casts. They are of undoubted value in establishing the existence of Bright's Disease, considered generically, but they afford comparatively little assistance in the Differential Diagnosis of the different forms. Any form of tube-cast may occur in any form of the disease, and almost at any stage. Indeed all the leading varieties may occur simultaneously in one case. I have often seen the hyaline (so called waxy) casts in the earliest stages of the inflammatory forms co-existing with epithelial, granular, and fatty casts. At the same time, it is true that epithelial, granular, and fatty casts are comparatively rare in the waxy and cirrhotic forms, while they are very common in the inflammatory; and even in its chronic stages they may be very copious. A large number are frequently thrown off when a patient is rallying from an exacerbation during the later stages.

III. DROPSY.

This symptom is of great importance, as indicating the existence of inflammation of the tubules. Whenever this exists to any extent Dropsy appears.

When the tubular affection disappears the dropsy speedily follows. It is entirely absent in the whole course of purely waxy and contracting cases ; or present only to a slight extent. But it invariably occurs in patients affected with these diseases when inflammation is superadded to them.

IV. THE COMPLICATIONS.

The coexistence of enlargement of the liver, presenting the features of waxy degeneration, with Bright's Disease, affords important evidence in favour of a diagnosis of waxy kidney. So also does a peculiar morbid condition of the blood which appears to attend upon waxy degeneration of the spleen, viz., a slight increase of the white corpuscles, with a flabby, pale condition of the red. Similar evidence is afforded by the occurrence of persistent diarrhœa.

The occurrence of the neuro-retinitis affords a strong presumptive evidence in favour of the cirrhotic form ; for although the complication is met with along with the other forms, it is comparatively rare.

Hypertrophy of the heart is met with in the advanced stages of all the forms, but is certainly most common in the cirrhotic, and the existence of it with a history of very insidious Bright's Disease ought to suggest the probability of the presence of that form of disease.

It may be convenient to present in a tabular form the features which are most characteristic.

TABLE SHOWING THE LEADING DATA FOR THE DIFFERENTIAL DIAGNOSIS OF THE DIFFERENT FORMS OF Bright's Disease.

HISTORY.				URINE.				DROPSY.	OTHER SYMPTOMS AND COMPLICATIONS.				
<i>Of pre-ex- isting Dis- eases.</i>	<i>Of existing Disease.</i>	<i>Quantity.</i>	<i>Colour.</i>	<i>Proportion of Albumen.</i>	<i>Deposits.</i>	<i>Uremia.</i>	<i>Eye Symptoms— Uremic.</i>		<i>Neuro Retinitis.</i>	<i>Thoracic.</i>	<i>Abdominal.</i>		
INFLAMMA- TORY FORM	Stage 1st	Scarlatina, diphtheria, measles, erysipelas, &c.	Generally acute, some- times gradual.	Diminished	Dark, smoky, or bloody.	Large.	Blood cor- puscles. Bloody, granular, and hyaline casts.	Early and severe.	Acute, with convulsions.	Occasional.	Very rare.	Inflamma- tions rare.	Peritonitis rare.
		...	...	Diminished or not in- creased.	Dark or pale.	Large.	Fatty, granu- lar, and hyaline casts.	Severe or diminished.	Acute, with convulsions, or chronic.	Rare.	Very rare.	Inflamma- tions rare. Hypertrophy of heart not uncommon.	Peritonitis rare.
		...	...	Diminished, normal, or increased.	Dark or pale.	Large.	Fatty, granu- lar, and hyaline casts.	Severe or slight, but occasionally recurring.	Acute, with convulsions, more com- monly chronic.	Rare.	Rare.	Inflamma- tions rare. Hypertrophy of heart common.	Peritonitis rare.
	Stage 1st	Syphilis, caries, or chronic sup- puration.	Commenc- ing in- sidiously.	Increased.	Pale.	None, or small.	None, or very few hyaline casts.	None.	None.	None.	None.	Phthisis common.	Liver and spleen en- larged. Diarrhoea.
WAXY FORM	...	...	Increased.	Pale.	Small, or large.	Few hyaline or finely granular casts.	None, or very slight.	None.	None.	None.	None.	Phthisis common.	Liver and spleen en- larged. Diarrhoea.
	...	...	Increased.	Pale.	Small, or large.	Few hyaline or finely granular casts.	None, or slight.	Chronic, or more rarely acute.	Very rare.	Very rare.	Very rare.	Phthisis uncommon. Hypertrophy of heart rare.	Liver and spleen en- larged. Diarrhoea.
CIRRHOTIC FORM	Early Stage	Gout, Lead poison- ing.	Commenc- ing very in- sidiously.	Natural.	Pale.	None, or small.	Few hyaline casts, or none.	None.	None.	None, per- haps occa- sional.	None.	None.	Occasional cirrhosis of liver.
	Advanced Stage	...	...	Natural or increased.	Pale.	Consider- able, rarely large.	Few hyaline, fatty, and granular casts.	None, or slight.	Chronic or acute, oc- curring occasionally.	Occasional.	Common.	Inflamma- tions occa- sional. Heart hy- pertrophied.	Peritonitis rare. Cirrhosis of liver occasional.

SUPPLEMENTARY CHAPTERS.

I.

ON THE SIMPLE FATTY DEGENERATION OF THE KIDNEY,
AND ON THE RELATIONSHIP OF FATTY DEGENERATION
TO BRIGHT'S DISEASES.

ALONG with fatty degeneration of the liver and of the muscular substance of the heart, with or without general obesity, we occasionally find a fatty degeneration of the kidney without any trace of inflammation. In clinical history and pathological characters these cases differ from those of the second stage of the inflammatory form of Bright's Disease, with which they are too commonly confounded. We are indebted to Dr George Johnson¹ for the first recognition of this affection. Mr Simon² in describing it says, "In the domestic cat—at least in our metropolitan cats—the tubules of the kidney almost invariably (though I presume abnormally) contain a very large quantity of oil; and I think it probable that the quantity may be artificially increased by interference with the locomotion and respiration of the animal. This is a condition of simple fatty accumulation, analogous probably to the fatty

¹Dr Johnson on the Pathology of Bright's Disease, *Medico-Chirurgical Transactions*, vol. xxix, p. 15; and *Diseases of the Kidney*, p. 392.

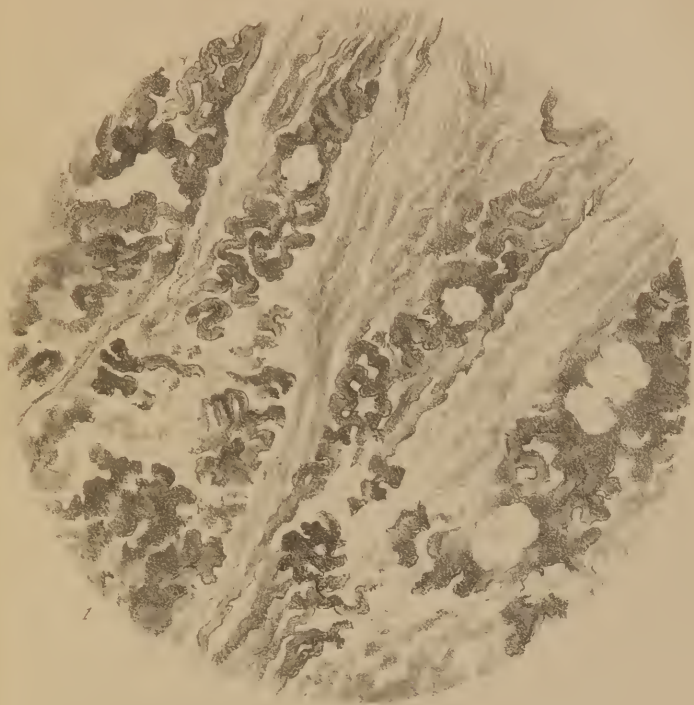
²Lectures on General Pathology, p. 185.

liver of the human subject. Though immeasurably greater in degree than any similar accumulation ever observed in the human kidney, it is attended by no destruction of the tubules; nor does it often, if ever, interfere with the functions of the organ, or with the health of the animal." He states further, that when he first observed this condition he thought it analogous to the scrofulous form of Bright's Disease.

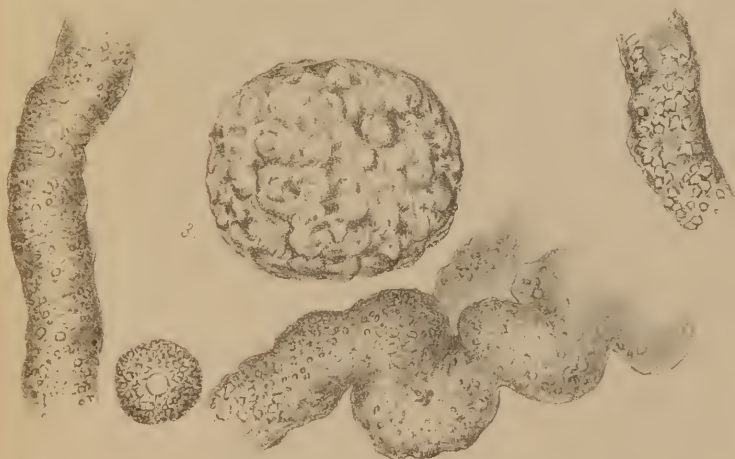
Organs affected in this way are generally of about the normal size. Their surface is smooth, and the capsule strips off easily. There is no congestion, and scarcely any stellate veins are visible. The organ is more soft and flexible than natural, and the surface is mottled with numerous deposits of sebaceous-looking material. On section, the relative size of the cortical substance and the cones is preserved, and, beyond a general pallor, there is no change, except the abundant deposition of sebaceous-looking material, mostly in the tubules of the cortical substance, but also in those of the cones.

On examining a section with a low power (*Plate VIII, fig. 1*), the characteristic fatty opacity is well marked, and by careful scrutiny it may generally be made out that the deposit is just within the lining membrane of the tubes,—in fact, not in the free cavity of the tube, but within the epithelial cells. The malpighian bodies, the vessels, and stroma, are natural. On examining with a higher power (300 to 400 diameters), the points above referred to are much more distinctly recognizable; and when a tubule is cut across, a clear space may be seen within, surrounded by fatty epithelium.—(*Plate VIII, fig. 2*.)

This peculiar condition I have had opportunity of studying in many cases, some very well marked, others less so; indeed, in the ordinary work of a pathological theatre we meet with every variety, from the slightest to the most intense. Under what circumstances does it appear? I have met with it only in cases of exhausting disease, such as cancer, and in individuals who appeared to have assimilated an undue amount of oily matter, as



1



2

was testified by the copious adipose tissue, and the fatty state of the liver and the heart.

1.—*Fatty Degeneration in connection with exhausting Diseases.*

Foerster¹ remarks that it occurs in cases of long-standing maladies, such as tubercle, cancer, and caries. Dr Otto Beckmann² confirms Foerster's statement, and records the following case :—" In a girl, who died at the age of eighteen, in a house of correction, there was found advanced cheesy hepatization of both lungs, with softening and cavities, cheesy infiltration of the bronchial and mesenteric glands, on the right side a recent, on the left an old pleurisy, very extensive tuberculous ulceration of the intestine, pigmented spleen, and very fatty liver. The kidneys were very anæmic, pale yellow, moderately large, with slight injection of the superficial stellate veins. In many of the tubules of the cortical substance and of the cones there was merely debris composed of larger and smaller fatty granules, in others the cells were retained, filled with fatty matter. The malpighian bodies were natural." Beckmann had no information as to the state of the urine.

In illustration of this condition, I subjoin the following case :—

Christina Thorburn, æt. 52, Ward XV., Dr Sanders.—The patient had for some time suffered from cancer of the œsophagus. Never had dropsy, albuminuria, or any symptom of Bright's Disease.

Autopsy.—The body was emaciated. There was no dropsy. The muscular substance of the heart was fatty. The right lung was natural; the left was adherent to the pericardium and the thoracic wall. On separating the left lung posteriorly below the root there was found a gangrenous condition of parts around the

¹ Foerster's *Pathologische Anatomie*, Bd. ii., s. 520.

² Virchow's *Archiv*, Band. xi., s. 65.

oesophagus. The pharynx was natural. The oesophagus was affected with cancer for three and a-half inches of its extent, commencing about the root of the lung, and extending to within two inches of the stomach. The cancer was epithelial, extensively ulcerated, and on the left side communicated with a small gangrenous cavity, bounded on front and at the side by the lung, posteriorly by the thoracic wall. The stomach was much contracted. The intestine was natural. The liver was extremely fatty. The spleen was natural. The kidneys were of normal size; their surface smooth, but pale, mottled with sebaceous looking material. The capsule stripped off readily. On section, the relative size of cortical and conical substances was natural. Many of the convoluted tubules were filled with sebaceous looking material. The vessels and malpighian bodies were natural. The epithelium in the affected tubules was loaded with fat, but the lumen of many of them was ascertained to be clear, surrounded by the fattily degenerated cells still in situ. There was no trace of exudation in the tubules.

In this case the amount of fat was such that it was apparent even to the naked eye, and on microscopic examination was as abundant as I have ever seen in the second stage of the inflammatory affection.

2.—*Fatty Degeneration in connection with Senile Marasmus.*

Dr Rosenstein believes that he has seen this result from Senile Marasmus, and gives the following case in illustration:—

A woman, aged 73, came into the Hospital on account of an injury to the face, and prolapsus ani. She stated that she had always been healthy, and exhibited no symptoms of any malady beyond that for which she sought admission. The prolapsus was great, and the exposed mucous membrane always discharged fluid and mucus. The urine was natural in quantity, and contained no albumen. In the last three weeks of her life she had diarrhœa, slight œdema of the legs, and albuminuria, but

no casts. At the autopsy the heart was found somewhat atrophied. The spleen was small, its capsule wrinkled and thickened. The liver was considerably diminished, with sharp fibrous edges; the surface smooth, pale yellow in colour, and fatty. The kidneys were small; the capsules were adherent; the surface finely granular, but without trace of congestion. On section, the cortical and conical parts were difficult to distinguish, of a pale yellow colour throughout. The epithelium of the tubules was everywhere fatty; the malpighian bodies were natural.

In commenting on the case, Rosentein remarks that, keeping in view the history, the symptoms during life, and the concomitant wasting of the liver and spleen, he cannot suppose an inflammatory condition to have existed, but, on the contrary, must conclude that it was due to senile marasmus. He refers the œdema which came on before death to the exhausting diarrhœa. If this view be correct, we have here another cause of the fatty degeneration under consideration.

3.—*Fatty degeneration from excess of Fatty Food.*

Certain observations make it appear that this condition may also rise from the introduction of an excess of fatty matter into the system. Dr Beale has found it in the kidneys of cats who lived in breweries, and thus enjoyed peculiar abundance of hydro-carbonaceous food, and little exercise. In the dog, the ox, and the calf, the kidney normally contains much oily matter. Dr Lang³ of Dorpat made the interesting discovery, that even in men, especially with very fatty food, some fat passes into the urine, as is almost constantly observed in cats and dogs. On examination of the kidneys Lang found the fat

³ A. Lang, De Adipe in urina et renibus, etc. Dorpat, 1852. Quoted by Beckmann and by Rosenstein, loc. cit.

granules in the cells most abundant in the convoluted tubules, a condition which Kölliker⁴ also observed in the kidneys of sucking animals. Beckmann found it most marked in some cases in the straight tubules. Reinhardt describes two cases in which the epithelium was very fatty, and in which there was no symptom of Bright's Disease during life. The best marked case of this kind with which I have met was in a lady of somewhat intemperate habits, who had become very obese. She had never suffered from any renal symptoms. Her body was very rich in adipose tissue, the abdominal wall, the mesentery, the subcutaneous tissue generally, and the heart being all loaded with it. The muscular substance of the heart was fatty, and the liver and kidneys presented excellent examples of extreme fatty degeneration. The epithelium in the kidneys for the most part adhered to the walls, and the tubules when cut across showed their lumen clear, and surrounded by the degenerated epithelium. It appeared in this case that the excess of fatty or carbonaceous matter taken into the system had led to the deposition in the epithelium.

We are thus entitled to conclude that we may have the simple fatty degeneration of the kidney in connection with exhausting disease, old age, or with excess of fatty food. In the two former cases it is probably a true degeneration, in the latter an infiltration or deposition. This is the form of fatty kidney quite unconnected with Bright's Disease. The question next arises, what relationship the degeneration actually bears to the different forms and stages of that malady?

The degeneration may be found in connection with any of the forms, and almost at any stage; but it always, when present, to a considerable extent affords evidence of the existence of inflammation in the part affected. Along with the waxy disease it is very common to find a greater or less number of tubules occluded by exudation enclosing

⁴ Würzburger Verhandlungen, vi, s. 183. Quoted by Beckmann.

fatty cells. In some cases this is so copious as to constitute a distinct addition to the primary affection, discoverable during life; in others it is so limited as to produce no symptoms, and only to be made out on careful post-mortem examination. In the contracting form the same is the case. It is not so with the inflammatory form. In it, after the earliest stage, fatty degeneration is widely diffused, and it is never got rid of until death or recovery takes place.

The degeneration always affects the epithelium, and indicates that its vitality is lost. I have never seen the fibrinous material in which the epithelium is imbedded presenting the fatty appearance. It manifestly results from the rapid augmentation of the cell contents which attends the inflammatory process. In acute atrophy of the kidney this change occurs in a few hours. In ordinary acute nephritis a few days may suffice for its production. The result is the destruction of the affected cells, and their removal either outwards along with the urine, or into the system by absorption. From the latter process atrophy necessarily results; for as the contents of the tubules are removed, the basement membrane closes in, and gradually the tubule altogether disappears. If, however, the dead tissue be removed in mass, new epithelium may be formed, and the parts restored.

II.

ON ACUTE ATROPHY OF THE KIDNEY, A CONDITION
SOMETIMES CO-EXISTING WITH ACUTE ATROPHY
OF THE LIVER.¹

THE frequent co-existence of fatty degeneration of the kidneys with acute atrophy of the liver is generally recognised; and most pathologists are prepared to admit that the process in the kidney is identical with that in the liver. It appears to me, further, that the kidneys may be primarily and mainly affected, the liver secondarily, and to a less degree.

The characters of the kidneys in both sets of cases are as follows:—They may be of the natural size, rarely somewhat enlarged, and in most cases smaller than normal. I have found the organs to weigh together between 6 and 7 ounces. They are flabby and congested, and sometimes blood is extravasated in the cortical substance. The cortical substance, and, to a less extent, the cones, present a dense, consolidated—sometimes a sebaceous-looking—appearance.

On microscopic examination the tubules in the cortical substance, and frequently also in the cones, appear opaque, as if distended with fine injection, and when a higher power is used, a series of changes may be traced identical with those which we find in the cells of the liver in cases of acute atrophy. Some are opaque, swollen, and cloudy, their nuclei obscured by a brownish material, which is, however, albuminous in character, clearing up under acetic acid. Others are crowded with fatty globules of various sizes, others are so broken down that they

¹ The substance of this chapter appeared in two papers read before the Medio-Chirurgical Society, and recorded in the *Edinburgh Medical Journal* for October 1865 and January 1866.

are represented only by molecular debris. In transverse sections of the tubules these changes may be particularly well seen. The malpighian bodies present no abnormalities, excepting that they are sometimes congested, and sometimes the seat of extravasation.

In illustration of the disease as it affects the liver and kidneys together, I select the following case:—

Mrs H., æt. 35, was admitted to the Royal Infirmary, almost moribund, on 11th February 1865. She was sent to one of Dr Warburton Begbie's wards, but died very soon after admission. Her history was imperfectly ascertained, as she was comatose at the time of her admission; but from inquiry among her friends who had been with her before she went to the Hospital, I ascertained the following facts:—She was in the sixth month of her fifth pregnancy, and was leading an unhappy life in consequence of domestic quarrels; but it was not known that any special disagreement had preceded her illness. She was in good health until a fortnight before her death, but then complained to her neighbours of a strange feeling of uneasiness, which she dreaded, but could not define. She gradually became worse, and began to vomit yellow matter like the yolk of an egg. She then also became affected with jaundice, and this gradually deepened. Her bowels were constipated. She never was drowsy or delirious, nor did she vomit blood nor pass it at stool until the morning of the 11th February, when she became much worse, vomited a large quantity of blood, became very heavy, and could not be roused. In the afternoon Mr Furley was called to see her, and by his direction she was taken to the Infirmary, the movement roused her, and she became for a little time conscious. On admission to the Infirmary she was shivering and complained of cold. She vomited blood almost incessantly. She passed her fæces in bed; they were dark-coloured and fluid. She made water, but it could not be collected for examination. About eight o'clock she became delirious, violent, and very noisy. This continued until midnight, after which she was comatose. Labour commenced about eight o'clock; the waters came away about nine. She was delivered of twins just as she was dying, at seven o'clock on the morning of the 12th.

Autopsy.—The body was examined thirty-one hours after

death. It was moderately well nourished. The skin was icteric and somewhat dusky. There was considerable hypostatic congestion, but no subcutaneous extravasation of blood. The muscles were dry; the blood dark and fluid. All the internal organs were jaundiced. There were patches of extravasation under the visceral layer of the pericardium, particularly over the left auricle, and towards the upper part of the left ventricle. The heart was moderately contracted, contained no clot, and very little blood. The muscular substance was somewhat pale; the valves were natural. The aorta was natural. The lungs were congested and somewhat œdematous, particularly at their lower and posterior parts. The liver was reduced to one-half its natural size; but, except being somewhat flattened, it retained its ordinary form. It weighed 1 lb. 7½ oz. Its surface was not shrivelled. Beneath its capsule and throughout its substance there were numerous ecchymoses, and small patches of an ochre yellow colour, but the mass of the organ was of a dark reddish brown hue. The outlines of the lobules were not recognisable. The gall-bladder was contracted, and contained a little grey inspissated mucus.

On microscopic examination of a scraping from a cut surface of the liver, a large quantity of debris and fatty matter, with cells in different stages of alteration, some full of oil globules, and containing a few bright ochre-yellow granules, and others full of dense granular matter, not fatty, were found. All the cells were, without exception, considerably enlarged, and denser than natural. No natural cell was observed. The amount of bile pigment found both in the cells and debris was less than is usual in such cases.

On examining sections it was found that the cells in the outer part of the lobules were almost completely destroyed, while those towards the centre were larger, denser, and more opaque than natural, and the amount of oil was greater towards the margins, where the destruction of cells was taking place. The system of vessels, and the fibrous stroma of the organ, were not destroyed. It was easy to make sections, and the sections were easily washed without their giving way. In the sections a considerable amount of bile pigment was seen scattered about.

Some demonstrations were made of the blood in the liver, but neither in it nor in the substance were any crystals or balls of tyrosin or leucine observed.

The spleen was enlarged, weighed 8 ounces, was soft and

pulpy. There were some points of extravasation in its substance and beneath its capsule.

The suprarenal bodies were somewhat enlarged and partially disorganized, but their microscopic structure was not ascertained.

The kidneys were somewhat enlarged, weighed together $10\frac{1}{2}$ ounces. Their cortical substance was dense and pale. The capsule was easily stripped off. On microscopic examination, the tubules, both straight and convoluted, were seen to be full of exudation, and presented the appearance of having been very successfully injected with some dark matter. The malpighian bodies and vessels stood out clear and transparent among the tubules. With a higher power the vascular structures appeared natural; the dark matter occupying the tubules was found to be composed of exudation into and between the cells. Very few tubules remained healthy; in some the epithelium was swelled, thickened, in a state of cloudy swelling, and here and there it was loaded with fat granules. In some parts the outlines of the renal cells could not be made out; the tubules were full of a dense homogeneous granular matter, containing numerous oil globules.

The œsophagus was natural. The stomach was distended, and contained a good deal of dark uncoagulated blood. Its inner surface was coated with slimy mucus; its walls were thickened, and in the mucous coat there were numerous catarrhal ulcers, mostly along the greater curvature, and on the anterior and posterior walls. Extravasation of blood existed about the bases of some of the ulcers.

The intestine contained scarcely any bile, but some altered blood, and a good deal of hard nearly clay-coloured fæces. The peyerian patches and solitary glands were swelled and prominent, particularly those about three feet from the lower end of the ileum. The large intestine was natural.

The pancreas was natural.

The mesenteric glands were somewhat enlarged.

The uterus was large, about 7 inches in length, moderately contracted; the cervix was long, and a plug of bloody mucus projected from the os.

Both ovaries were much scarred, and each contained a distinct corpus luteum.

The fallopian tubes, particularly their fimbriated extremities, were congested.

The skull was natural. There was a little subarachnoid effusion. The brain was firm, somewhat congested throughout; it weighed 2 lb. 6½ oz. The ventricles were not dilated. There were a few small cysts in the choroid plexus.

The bladder contained nearly 16 ounces of dark amber-coloured urine, which was carefully removed and sent to Dr Arthur Gamgee, who kindly analysed it, with the following result:—

“The urine was of an intensely jaundiced hue, and exhibited in a very characteristic manner the reaction of bile pigment. Its reaction was acid. It was divided into two portions—A and B.

“The portion A, measuring 200 c. c., was precipitated with neutral and basic acetate of lead, and the fluid filtered. The lead precipitate was reserved for the analysis of the bile acids.

“The filtrate was treated with a stream of sulphuretted hydrogen gas, in order to precipitate the excess of lead, and the clear and almost colourless filtrate thus occasioned was concentrated at a very gentle water-bath heat, and then placed aside in a cool place. At the end of twenty-four hours an abundant crystallization had taken place. The crystals, when examined under the microscope, were found to consist of the most characteristic needles and tufts of tyrosin, tinged of a light yellow colour; they were separated by filtration and dissolved in boiling water. On cooling, the water deposited a nearly snow-white mass, composed of beautiful needles of tyrosin; these were again crystallised from a solution in boiling water, and then dried. In the process of drying they contracted very much. When strongly heated they burned away, without leaving a trace of ash. They exhibited in a most characteristic manner the chemical reactions of tyrosin.

“The fluid from which the tyrosin had been separated was evaporated to a syrupy consistence, and set aside for some days. When examined it was found to contain, in addition to much tyrosin which had separated, characteristic masses of leucine.

“The precipitate which had been obtained by precipitating the urine with acetate of lead was suspended in water, and a stream of sulphuretted hydrogen passed through it. The fluid was filtered and evaporated at a gentle heat. The residue was dissolved in water, and tested by Pettenkoffer’s test for bile acids, but none were found.

“The smaller portion of urine (B) was employed to determine

the presence and quantity of the more usual urinary constituents, and the results of the analysis are tabulated below.

“The points which specially call for notice are the following:—
1st, The urea was determined by Liebig’s method. As tyrosin is, equally with urea, precipitated by nitrate of mercury, the results of the analysis are obviously not perfectly correct, the urea and tyrosin having in fact been estimated together. As the tyrosin appears to have been present in very large quantity, it may be assumed that the amount of urea was actually very small. *2d*, The amount of uric acid could not, from the excessively small quantity of urine which was obtained, be estimated; only traces of it, however, existed. *3d*, The urine contained absolutely no chlorides, only the faintest trace of sulphates, and the earthy phosphates were absent. The only salts present were thus alkaline phosphates. This fact, which was brought out by the qualitative analysis, was also born out by the quantitative; for the amount of phosphoric acid which was found when calculated as phosphate of potash is almost identical with the amount of ash as found by direct ignition.”

Table showing the result of the analysis of urine.

Specific gravity of urine at 60° Fahr.,	1018·82
Reaction acid.	
Total solids in 100 c. c.,	2·194
Urea and tyrosin in 100 c. c.,	1·80 gramme.
Leucine, uric acid, and colouring matter in 100, c. c., .	·1415
Albumen,	·0116
Salts,	·2525
Phosphoric acid,	·204

This case affords a very good example of the acute atrophy of the liver, but it seems also entitled to special notice in regard to the state of the urine, as recognised by Dr Gamgee, and the peculiar condition of the kidneys.

I. *The State of the Urine.*—The points which appear to be most important are,—*1st*, That notwithstanding the presence of a large amount of abnormal ingredients, the *total solids* were considerably below the natural quantity, and thus the functional activity of the kidneys was shown to be diminished; *2d*, That *leucine and tyrosin* were the

chief abnormal ingredients, as is usual in this disease; 3d, That a little *albumen* was present; 4th, That notwithstanding the extreme jaundice, *no bile acids* were found,—a fact which, at first sight, seems to confirm Dr Harley's view, that these constituents are wanting in cases of jaundice from suppression; but this point cannot be deemed important when we consider that only Pettenkoffer's test was employed, a test which chemists do not now consider satisfactory; 5th, That the *urea* was probably much diminished in quantity, and only traces of *uric acid* were found, while in most febrile and hepatic affections these elements are found in excess; 6th, That the *chlorides and earthy phosphates* were entirely absent, and that only the faintest trace of *sulphates* was found.

It is evident that some of these altered conditions of the urine depended upon the state of the kidneys, and some upon that of the liver and the system generally. There can be little doubt that the leucine and tyrosin resulted from changes in the liver, and that they were eliminated from the kidneys along with the water at a time when the renal epithelium had become incapable of separating from the blood the natural solids of the urine. The absence or diminution of some of the elements—as the chlorides, earthy phosphates, and sulphates—may have depended upon the state of the system generally, but almost certainly the diminution of the urea depended upon the peculiar condition of the kidneys, for Frerichs has found that in this disease its quantity in the system is rather increased than diminished.

It is to be regretted that the only urine obtained for analysis was that found in the bladder after death. It is very probable that, had we been able to examine the urine for some days before death, we might have found, as did Frerichs in some of his cases, a progressive diminution of the urinary solids coincident with changes in the kidneys. It seemed impossible that kidneys in the state in which this woman's were found could be capable of any secretion at all; and, from this consideration, I think that the urine

which was in the bladder had been secreted some time before, but retained in consequence of the torpid state of the nervous system. I have seen at least one case in which suppression of urine had occurred, in the course of pyæmia, and in which the kidneys were much less affected than they were in this instance.

But though we cannot in the meantime speak positively upon these points, it is evident that in every case of this disease the urine should be carefully examined, and that in treatment constant attention should be paid to the state of the kidneys.

II. *The Affection of the Kidneys.*—The state in which we found the kidneys specially deserves attention. A very copious exudation occupied the uriniferous tubules, and the epithelium was affected in the same way as were some of the cells of the liver. Some of the cells were swelled, dense, opaque, granular, some extremely fatty, and some had broken down and disappeared,—a series of changes exactly corresponding with those of the liver. But for the firmer support which the stroma of the kidney and the walls of the tubules affords, we might expect a rapid wasting of the kidney like that which occurs in the liver.

The complete identity of the appearances met with in the two organs satisfies me that they were really affected in the same manner, that the morbid processes were identical, and that we cannot regard the renal affection as a consequence of the hepatic.

In illustration of the disease affecting primarily and chiefly the kidneys, I select the following case:—

M. M., aged 22, was of dissipated and abandoned habits, but always enjoyed good health till the commencement of this illness. In October 1865 she was far advanced in pregnancy, and on the 20th of that month, without known cause, she became suddenly ill, with symptoms which were referred to inflammation of the uterus. But as no satisfactory treatment was possible where she resided, and as she was becoming rapidly worse, she was sent to

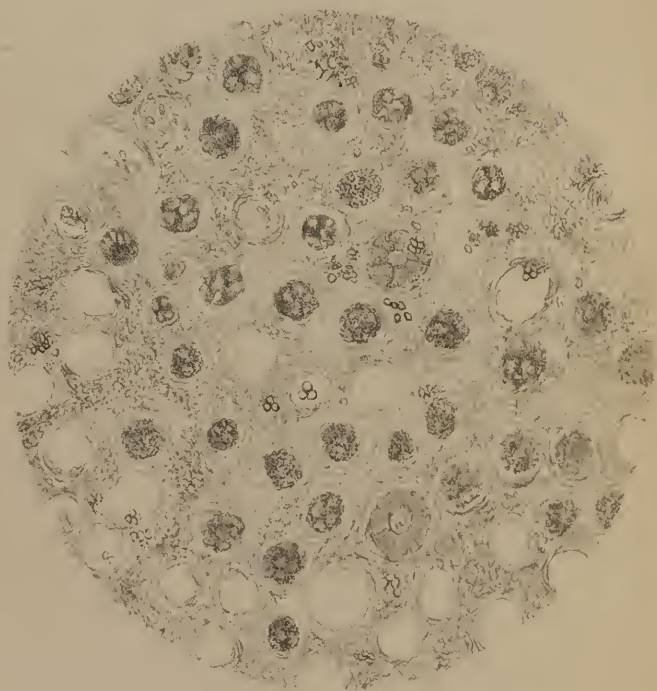
the Maternity Hospital. She was admitted on Friday evening, 22d October. She was then very weak, and was vomiting stringy mucus, with streaks and clots of blood, and now and then matter like coffee-grounds. This continued, notwithstanding the employment of suitable remedies, until Sunday morning, October 24th, when she began to sink rapidly. At that time premature labour was brought on by direction of Dr Graham Weir. She was delivered of a putrid child about 4 P.M., and died at 8 o'clock the same evening. She was never unconscious, remaining quite intelligent until within a few minutes of her death. She had also no convulsions, nor any distinct delirium. She passed urine several times after her admission, but it was in small quantity, and its composition was not ascertained.

Autopsy, forty hours after death.—The body was well nourished. There was no dropsy. Decomposition was rapidly advancing. The pericardium was natural. The heart contained a moderately firm clot, but the blood generally was dark and fluid. The muscular substance of the heart was flabby, but the valves were healthy. Both lungs were congested throughout, particularly towards the base posteriorly. There were traces of old tubercle at the left apex. The liver was of natural size, soft, and flabby, but not friable; the outlines of its lobules were distinct. The spleen was pulpy. The kidneys were small, and weighed together $6\frac{3}{4}$ ounces. They were flabby, congested, and in the cortical substance there were numerous extravasations. That part was not increased, but rather diminished in size, and contained some yellowish-white deposit, which was rendered the more distinct by the surrounding congestion. The stomach contained some dark green matter, like altered blood; its mucous membrane was catarrhal, and was perforated by numerous minute ulcers. Some parts were deeply congested, and at others there were patches of extravasation. The upper part of the small intestine contained bile and altered blood. The coats throughout were normal. The large intestine was natural. The ovaries were natural. The uterus presented the ordinary appearance of one recently delivered, and was moderately contracted. The bladder contained scarcely any urine; its coats were normal. The head was not examined.

Microscopic examination of the Kidneys.—The whole organ was found to be altered. The tubules, both in the cortical substance and in the cones, were opaque, and appeared as if distended with



PLATE IX.



fine dark injection. On examination with a higher power, the distention of the tubules was found to depend partly upon enlargement of the epithelial cells and partly upon free exudation, which occupied the cavity of the tube. The cells were in some parts opaque, of a brownish colour, and full of dense granular matter, which obscured the nuclei; in others, they contained fatty granules of large size, surrounded by numerous firm fatty molecules; in others, they were represented by groups of oil globules, inclosed by an indistinct cell wall, which broke down under very slight pressure. So great was the friability of these fatty cells, that when a scraping of the kidney was examined, the pressure of a light covering glass sufficed to break down the tube-casts to a fine molecular debris. In transverse sections of the tubules the changes were well seen; in some the epithelium enlarged, dense, brown, filling up the lumen; in others, the opaque matter replaced by fat, the outlines of the cells remaining entire; in others, the cells broken down, and represented by groups of fat granules; others were entirely empty.—(*Plate IX.*)

The condition of the stroma was also interesting; it was somewhat enlarged, and contained numerous fatty granules. Many of these were arranged in little groups and lines, and appeared as if situated in the connective tissue-corpuscles. The corpuscles were certainly somewhat enlarged, from which it appeared that the lesion was not confined to the tubules.

From the fact that, although every tubule which was seen was distended, the cortical substance was diminished rather than increased, and the organs were below their average weight, it is evident that considerable wasting of the organ must have taken place, and this we can well understand when we think of the rapid fatty disintegration which was going on. The distinct diminution of bulk of the organs, and the rapidity with which it was taking place, seem to warrant the application of the name "acute atrophy."

The very striking similarity between the conditions just described and those accompanying acute yellow atrophy of the liver cannot be overlooked, whether we regard the general appearance of the organ or its microscopic characters. The whole series of changes, from the exudative infiltration to the complete disintegration of the cells, was identical with that found in the case of Mrs H., recorded above.

Microscopic examination of the Liver.—Under a low power the hepatic cells were seen to be unusually opaque, while towards the margin of each lobule there was a dark zone of fatty degeneration; and outside of that—i.e. at the point of contact of neighbouring lobules—there was a clear space in which no cell was visible, only a little granular debris. Under a higher power, the cells were found to present exactly the characters of those met with in acute yellow atrophy—that is, some were enlarged, opaque, full of dense granular matter; others were fatty; others were in an advanced state of fatty degeneration, extremely friable, easily broken down. These different stages were also distributed in the lobules, just as was described in my former case—the swollen infiltrated cells being in the centre, surrounded by those in a stage of degeneration, these again surrounded by the space in which no cell element remained. There was no breaking down of the stroma of the organ, nor any marked bile-staining of the cells, nor retention of bile in the ducts.

It may be suggested that this change was an ordinary fatty degeneration, occurring in its usual seat, towards the margin of the lobule, and not at all to be wondered at, considering the character and habits of the patient. But I think it was something more—firstly, because the appearance of the fatty cells was unlike what we ordinarily see; secondly, on account of the peculiar opacity of the cells in the centres of the lobules; thirdly, because fatty degeneration never leads to destruction of the cells, as was seen in the periphery of the lobules, while in all these points the appearances are characteristic of the acute yellow atrophy.

It appears to me that we are entitled to regard this case as an example of a disease essentially identical with acute yellow atrophy, for the following reasons:—

1st, The pathological appearances in the kidneys and liver were the same as those met with in acute yellow atrophy.

2d, The leading symptoms of this case,—the peculiar malaise, the sickness and vomiting of blood, the rapid sinking, the congestion of the lungs,—are among the chief of those met with in that disease.

3d, The circumstances of the patient. She was advanced in pregnancy, was leading an exposed and wretched

life,—two conditions very commonly associated with atrophy.

From these considerations my view seems to be well established; at the same time, three important symptoms were entirely wanting, viz., delirium passing into coma, icterus, and diminution of the volume of the liver.

The absence of nervous symptoms, such as delirium, coma, and convulsions, is very strange, considering the condition of the kidneys; for with that condition one would have expected well-marked uræmic symptoms. The bladder was empty, and the kidneys were obviously incapable of secretion. But the symptoms of the acute and of the chronic form were alike absent. This can, I think, be explained only on the hypothesis, which is consistent with the other facts of the case, that the patient died before there was time for the phenomena of uræmia to be developed.

The icterus and the diminution of the volume of the liver often occur late in cases of acute atrophy, sometimes not at all; and it may well be believed that in this instance death took place before there was time for their manifestation.

In regard, again, to the symptoms which were present, this case seems to teach an important lesson; for the hæmatemesis, which is so frequent a symptom in acute yellow atrophy, occurred here, although the liver was comparatively little diseased; thus showing that it is not dependent on the hepatic affection. May it not be the result of a blood-poison?

If it be admitted that the malady in this case is of the same nature as acute yellow atrophy, it certainly gives the *coup de grace* to the theory which would make the renal affection in that disease secondary to the hepatic. It at the same time remarkably confirms the opinion that acute yellow atrophy is a blood disease. The general appearance of the body, the marked hypostatic congestion and rapid decomposition, the softness of the spleen, the darkness of the blood and its imperfect coagulation, the

occurrence of identical morbid conditions in the liver and kidneys, and the peculiar nature of the process in both organs, differing as it does from ordinary inflammation and from ordinary fatty degeneration, and the peculiar circumstances under which it occurred, all point strongly to some cause operating on the system from the blood.

The case, then, supplies an additional point in the history of acute yellow atrophy, and decidedly supports the view of its being dependent on a blood poison.

The only similar cases that I have found are three published by Rokitansky in 1859, under the name of fatal steatosis of the liver and kidneys,¹ and two by Dr Hecker of Munich, in 1867. I shall not detail Rokitansky's cases, but merely mention certain general facts in regard to them. All were females, unmarried, aged 23, 38, and 8 years respectively. Two had been in depressed spirits. All were stout, well nourished, and died after about a week's illness, during which the leading symptoms were—fever, headache, vomiting of dark matters, convulsions, and coma; in two there was slight icterus. On post-mortem examination, ecchymoses were found in many of the internal organs. The livers were large, pale, flabby, and fatty; the kidneys were also large, fatty, congested, and mottled with extravasated blood; the urinary bladders contained scarcely any urine; in two the stomach and intestines contained altered blood. Microscopic examination showed in all three cases extreme fatty degeneration of the liver and kidneys.

Rokitansky distinctly recognises in these cases a poisoned condition of the blood, which, however, he regards as a consequence, not a cause, of the hepatic and renal affections; and, in accordance with a favourite view, he regards the renal affection as secondary to the hepatic. He refers the fatty condition of the liver to that state of the system in which an excess of fat is present, and a tendency

¹ Ueber lethale Leber-und Nieren Steatose, von Prof. Rokitansky. Zeitschrift der k. k. Gesellschaft der Aerzte zu Wien, Aug. 1859.

to fatty deposition exists, and having excluded, with regard to the kidneys, the theory that it might depend upon Bright's Disease, he concludes by saying, "There can be little doubt that the steatosis of the kidney was secondary to the primary steatosis of the liver; and just as little doubt—from the diminution of urine consequent upon kidney disease on the one hand, and the slight degree of cholæmia on the other hand—that the sudden development of the fatal symptoms depended upon uræmia. It would accordingly appear that fatty degeneration of the liver may occur in an individual inclined to excessive fatty deposit, and to this, sooner or later, a fatty condition of the kidney may be superadded, both of which, gradually and unobserved, may attain such a degree that secretion of bile and urine is suspended, and death supervenes suddenly, after the appearance of slight icterus, by uræmia and an hæmorrhagic decomposition of the blood."

Notwithstanding the profound respect to which every opinion of Rokitsansky is entitled, I would venture to suggest that the narratives are capable of another interpretation, especially when examined by the light of the remarkable cases which have just been described. It is very difficult to believe that so general and important an affection of the liver and kidneys should have gradually advanced, and yet for long have led to no symptom; still more is it difficult to understand how so insidious an affection should have suddenly produced such violent symptoms; how the uræmia should have been unaccompanied by any trace of dropsy, or should have led to a hæmorrhagic condition of the blood; and, on the other hand, all the symptoms correspond closely with those of acute yellow atrophy, and many of them with that peculiar variety of the disease which I have described. These cases, indeed, seem to constitute a connecting link between the affection in its ordinary form, in which the liver is mainly involved, and the peculiar variety described above, in which the kidneys are the primary seat of disease.

I am indebted to my friend and colleague Dr Matthews

Duncan for drawing my attention to Dr Hecker's² observations on this subject. His attention had been directed to it by observing a typical example of acute atrophy of the liver. And he found that in puerperal women a severe and rapidly fatal disease sometimes arises, which, with obscure symptoms—without jaundice or hemorrhage from the bowel—is first recognised at the dissection as consisting of a fatty degeneration, which certainly must have occurred at the soonest towards the end of pregnancy. Appearances corresponding with these he has sometimes met with in new-born children. He records the following case:—

A pale, thin woman of twenty-one was admitted to the Hospital at half-past two on the afternoon of Dec. 22d, 1866. She came on foot. Eight days before she had been examined, and the internal os found dilated. At 3 P.M. on the 23d she had a severe rigor, followed by heat, quick pulse, breathlessness, and severe epistaxis. At 5.30 she was delivered of a child, which appeared to have been eight days dead. Considerable bleeding followed the removal of the placenta. The patient said she felt well, but was pulseless; and at 6.30 she suddenly died.

On post-mortem examination, there were some slight extravasations within the cranium. The lungs were congested and œdematous; there was no trace of embolism. The bronchi contained some bloody mucus. The heart was soft, its fibres natural. Extravasations existed here and there beneath the pericardium. The substance of the liver was dark brownish red, the stroma somewhat increased; the hepatic cells were granular. The spleen was considerably enlarged and pulpy. The mesenteric glands were swollen. Both kidneys were in a state of cloudy swelling; the tubules were filled with granular matter. There were recent extravasations in the pelvis, and in the walls of the bladder. There was no air in the veins; the uterus was flaccid, blood was extravasated into its substance.

² *Monatschrift für Geburtskunde und Frauenkrankheiten*, band xxix., s. 321, und xxxi., s. 197.

Dr Hecker ascribed the death to dissolution of the blood, a result of renal and hepatic disease.

He gives cases of similar acute atrophy in human infants, as well as in the young of some of the lower animals.

Another case which he has more recently recorded is as follows:—On July 16th, 1867, he was informed of the death of a patient who had been delivered on the 15th without accident. She had suddenly become breathless, and died twenty-eight hours after the confinement. At the examination, twenty-three hours after death, there was little decomposition, and no dropsy nor jaundice, but numerous ecchymoses over the abdomen. In the thorax there was a good deal of yellow serum. The lungs were congested, and somewhat œdematous, with numerous subpleural extravasations. The heart substance was brittle; beneath the endocardium there were many ecchymoses; valves natural; no embolism of pulmonary artery. The liver was very yellow, not reduced in size, soft and fatty. The spleen was enlarged, pretty hard, almost waxy-looking. The kidneys were distinctly in the second stage of parenchymatous inflammation; capsule readily separable; parenchyma swollen; cortical substance yellow. The uterus weighed 1100 grammes; its walls thickened; the mucous membrane easily separated from the muscular substance; in the cervix there had been copious hemorrhage; there was a corpus luteum in the ovary. The walls of the large intestine were infiltrated with extravasated blood which had not made its way through, the fæces being of natural colour. In the stomach and duodenum a similar condition existed. The lymphatic glands were swollen. On microscopic examination the fatty degeneration of the heart, liver, and kidneys were in parts very distinct, especially in the kidneys.

These different cases appear to me to illustrate a series of diseases, or phases of one disease, resulting from poisons generated in or introduced into the system; and

some are not very far removed from what would be universally recognised as examples of inflammatory Bright's Disease. I believe that their further study may lead to valuable results.

I have long held that all these processes are results of blood-poisoning: and, in addition to the clinical and pathological evidence which the cases narrated contain, it appears to me that the recent observations on the state of the viscera in poisoning with phosphorus confirm this view. We can with that substance artificially produce a disease scarcely distinguishable from some of the cases to which I have referred. Dr Ranvier,³ one of the most recent writers on the subject, states that the kidneys of those poisoned with phosphorus show the characters of complete and diffused steatosis. He describes some of the tubules as being filled with an albuminoid substance; others in a state of extreme fatty degeneration, which is occasionally so marked that the epithelial cells have entirely disappeared. These conditions are identical with those above described. Such results strongly corroborate the opinion that poisons in the blood induce the visceral lesions.

³ Journal de l'Anatomie, No. 2, 1867.

III.

ON THE NATURE OF THE WAXY OR AMYLOID
DEGENERATION.

IN the present state of science it appears not to be out of place to devote a supplementary chapter to an account of the views entertained as to the nature of the Waxy or Amyloid Degeneration. I shall not enter into the history of its discovery and gradual elucidation further than may be necessary for explaining the views entertained by different observers.¹

The degeneration consists in the replacement of the natural tissues by a peculiar pale, dimly translucent material, which assumes a characteristic coloration with iodine and other colouring matters, is little liable to undergo decomposition, and resists the action of most re-agents.

It tends to affect cells, small arteries, capillaries, and non-voluntary muscular fibres; and in a great majority of cases wherever it appears in the body it will be found to affect these structures. In the arteries it first attacks the transverse fibres of the middle coat, and afterwards extends to the other elements of the wall. It may be well to state, in a word or two, its mode of manifestation in different organs. In the *Liver* it occurs, 1st, as a general affection of the cells, rendering the organ large, pale, waxy looking, cutting cleanly, and showing at the sharply angular margins a degree of translucency. On microscopic examination the cells are found considerably enlarged, dimly translucent, with their nuclei obscured. 2d,

¹ I would refer the reader to an article in the Ed. Med. Journal for 1868, in which the early history of its discovery in Edinburgh is clearly set forth; also to an inaugural dissertation "Ueber die Amyloide Degeneration," by Dr Arnold Pagenstecher, Wurzburg, 1858.

As a general affection of the smaller branches of the hepatic artery, and apparently also of the portal vein, the cells being unaffected, and the condition only distinct when microscopically examined, and tinged with iodine. 3d, As a general affection of the vessels and cells in certain individual parts, here and there forming masses which closely resemble bees-wax. This condition has been rarely met with.² 4th, A diffused affection of the cells and vessels throughout the organ. In the *Spleen* it affects the smaller arteries, the malpighian bodies, and more rarely the pulp. In the *Kidneys* it affects the malpighian bodies and small arteries, rarely extending to the basement membrane of the tubules, or to their contents, but constantly leading to secondary infiltration of the organ, as has been described in the body of the work (*Chap. VIII*). In the *Stomach* it affects specially the small arteries. In the *Intestine* the small arteries, the epithelium covering the mucous membrane, the muscular substance of the mucous coat and of the villi (Brücke's muscles), are its chief seats, but it never affects the substance of the tissue of the villi, and rarely the muscular substance of the middle coat. In the *Pancreas* it affects the small arteries, and not, so far as I have seen, the secreting structure. The arteries are also most frequently affected when the disease involves *Lymphatic Glands*. The *Muscular Fibres* of the uterus and the arteries of the vaginal wall are occasionally affected. I have never seen it in the lungs nor in the brain, though some observers speak of it in both these situations. In the *Heart* I have seen distinctly waxy vessels. I am informed that Dr Gairdner has found it in cancer. Dr Bennett³ states that he has seen it in the *placenta*. In the *Skin* it sometimes occurs. Indeed, it would appear that, while the above-mentioned are its chosen seats, it may occur anywhere in the body.

² British and Foreign Medico-Chirurgical Review, Oct. 1864. Die Krankhaften Geschwulste, bd. ii, s. 430.

³ The Principles and Practice of Medicine, 5th ed., p. 250.

The peculiar colorations which the waxy material undergoes have attracted much attention. Virchow⁴ was the first to show that with iodine it assumes a peculiar mahogany red hue, and that the further addition of sulphuric acid changes the colour to violet. The reaction with iodine is, in my opinion, the best test of this material, being easily produced, and quite unmistakeable. That with sulphuric acid is less reliable, for it often fails to produce a blue, although generally a purple colour appears. Some writers deny the possibility of getting the blue colour described by Virchow. I have seen it perfectly distinct, but have, on the other hand, so often failed to obtain it, that I generally content myself with the iodine test. This may be employed simply by pouring a little of the aqueous solution (liquor iodi of the British Pharmacopœia) over the surface, when the naked eye will at once detect the appearance; or it may be applied to microscopic sections. Dr Bennett has shown that equally distinct coloration may be obtained with other materials, such as carmine and magenta, but none is so convenient for use as the iodine.

Many views have been advanced as to the chemical composition of this material. Heinrich Meckel⁵ conceived that it was cholesterin, and proposed to term the degeneration the cholesterin disease. He thought it in some way related to the fatty degeneration. His view has been totally disproved by the reaction already mentioned—cholesterin behaving with re-agents very differently from the waxy material—and by the chemical analyses to which I shall presently refer. Virchow at one time held that the waxy material was allied to cellulose, and therefore proposed to term it the amyloid degeneration. This view also has been completely disproved. Its origin, however, is still worthy of attention. It had long been

⁴ Virchow's Archiv, band vi.

⁵ Ueber Speck und cholesterinkrankheit. Annalen des charité-krankenhauses, band vi. Quoted by Pagenstecher.

thought that no starchy material existed in the animal body, that, in fact, starch and cellulose were characteristic of the vegetable kingdom. But C. Schmidt⁶ proved their existence in the mantle of the Phallusia, one of the Tunicata; Lœwig and Kölliker⁷ found a similar material in some Ascidians, and Dr Berthelot⁸ succeeded in transforming this matter into sugar. Professor Purkinje of Prague discovered in the brain and spinal cord the bodies which he termed corpora amylacea. They resemble starch granules in their appearance, being of oval form, and distinctly composed of concentric layers. Some of them assume a bluish colour with iodine; others a reddish hue, and, on the further addition of sulphuric acid, become blue or purple. Some again, which are encrusted with calcareous material, present no such reactions, at least until the mineral matter has been dissolved by acids. Similar concretions have been found in the prostate gland; and Friedreich⁹ has described them as occurring in various morbid conditions in the lungs. All these corpora amylacea are in truth local products, consisting of successive layers deposited from the fluids of the tissues around a nucleus of blood or other matter. It was conceived that these materials might be truly starchy, or allied to starch; and Dr Carter¹⁰ even stated that he had found starch granules in many of the healthy tissues of the body. Virchow,¹¹ observing a certain starch-like appearance in the sago spleen, tested it with the re-agents which had been applied to the corpora amylacea, and thereby discovered the reaction above described. Advancing in the

⁶ C. Schmidt. Zur vergleichenden Physiologie der wirbellosen Thiere, s. 62.

⁷ Annales de Science Naturelle, 3mo ser. tome v, p. 193.

⁸ Recherches sur la transformation en sucre de divers principes immédiats contenus dans les tissus des animaux invertébrés. Gazette Medicale, 1857, p. 618.

⁹ Virchow's Archiv., band ix, s. 613.

¹⁰ Edinburgh Medical Journal, March 1858.

¹¹ Virchow's Archiv., band vi, and Cellular Pathology, p. 371.

line of thought which was then followed by scientific men, he concluded that this degeneration might, in truth, consist in the production of a substance allied to cellulose, instead of the natural tissue of the affected part, and proposed for it the name amyloid degeneration. This term is now universally recognised as incorrect, but being in general use may be still retained. Carl Schmidt¹² attempted to form sugar from the waxy material and the corpora amylacea, but in vain.

Kekule and Friedreich¹³ made a number of careful analyses of waxy spleens, and found that, though the waxy spleen contains a considerable amount of cholesterin, that substance is not the cause of the reaction with iodine and other re-agents; that the waxy spleen contains no material chemically resembling starch or cellulose; and that the so called waxy material is closely allied to albumen and other members of the protein group of substances, for they found it to be—

C53·58	H7·00	N15·04
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while albumen is, according to Dumas and Cahours—

C53·5	H7·1	N15·8
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C53·4	H7·2	N15·7
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C53·5	H7·3	N15·7
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According to Lieberkühn—

C53·5	H7·0	N15·6
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And according to Rüling—

C53·8	H7·1	N15·5
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They thus made out the important fact that the waxy material is a nitrogenous substance closely allied to albumen.

Kuhne and Rudneff¹⁴ repeated the experiments of Kekule and Friedreich, employing certain new methods, with the result of fully confirming their conclusions. They point out that the waxy material differs from ordi-

¹² Annal. d. Chemie und Pharmacie, band cx, s. 250.

¹³ Virchow's Archiv., band xvi, s. 59.

¹⁴ Virchow's Archiv., band xxxiii, s. 66.

nary albumen in several interesting particulars; for example in its slowness of decomposition, they kept pieces exposed to the air for months, and found that it did not alter, and in its resisting solvents, such as weak alkalies, not quite concentrated acids, and gastric juice.

Dr Dickinson¹⁵ states, that from analysis of seven waxy livers compared with seven healthy organs, he found that while the latter contained 1 per cent of alkaline salts, the former contained only .754 per cent. He thus conceives that the waxy material differs from albumen and fibrine mainly in that it contains less alkali. I am not aware that any analyses have as yet been made to test the results obtained by Dr Dickinson; his statements upon this point must be recognised as interesting, though not in the meantime fully established.

Two main views are entertained as to the mode of production of the waxy material. Some, as Budd, Portal, Rindfleisch, and Dickinson, regard it as an infiltration or deposition of a peculiar matter from the blood; others, as Schrant, Rokitansky, and Oppolzer, regard it as a true degeneration or metamorphosis of tissue.

Rindfleisch¹⁶ acknowledges that he cannot prove the existence of the material in blood; that he only knows it as it appears in the tissues. The evidence of its blood origin is, he remarks, merely circumstantial, and the only consideration he adduces is the observation of Friedreich and Biermer, that masses of extravasated blood assume, under certain conditions, the waxy reaction with iodine. He says that an albuminous material of the blood, passing through the walls of vessels, becomes consolidated, and constitutes the waxy material. As spontaneous consolidation is a characteristic of fibrine, he thinks it probable that the material is a modification of that substance. Dr Dickinson¹⁷ has advanced a step further, and has

¹⁵ Medico-Chirurgical Transactions, vol. i, p. 39.

¹⁶ Lehrbuch der Pathologischen Gewebelehre, s. 33.

¹⁷ Loc. cit.

sought to show that the exuded material is de-alkalized fibrine. His experiments have satisfied him that fibrine, artificially deprived of its alkali, reacts with iodine like the waxy material; that when alkali is restored to the fibrine, or added to the waxy material, the reaction no longer appears—and upon these data his theory is founded.

These views are interesting, and the observations, so far as I have seen, correct; but it is doubtful whether there are grounds for believing the substance derived from the blood at all. In seeking to solve the question, it is important to distinguish between the waxy degeneration proper and the secondary deposit of fibrinous material which results from it. That it is not an infiltration will become apparent if we consider the parts it affects. We have seen that it affects the cells of the liver. This might well be a result of infiltration, for we constantly see the same structures loaded with fat which has been poured out from the blood. But far more generally throughout the body it affects small arteries. How is this to be explained on the infiltration theory? How can it happen that the small arteries—nay, the small arteries of certain organs—nay, the middle coats of the small arteries—should be the chosen seat of deposit of a material poured out from the blood? If it be poured out from the blood, why does it so generally confine itself to the walls of arteries and unstriated muscular fibre? Why does it not infiltrate the parenchyma of organs? Why does it, in the intestine, as it flows from the blood, confine itself to the walls of small vessels, to the muscles of Brücke, to the epithelium? Why does it not pass out among the cellular tissue of the villi, and become deposited there? These questions can scarcely be answered by those who hold the infiltration theory.

On the other hand, how exactly the characters correspond to those of the degeneration,—certain tissues always primarily affected, those tissues presenting every degree of alteration from the slightest to the most distinct, the surrounding parts remaining unaffected. The closest analogy exists between what is seen in this, and in the

atheromatous and calcareous degenerations, the former affecting the inner coat of arteries, and especially the deeper layers, the latter, when primary, affecting the middle coat. Both are independent diseases originating in the tissues, not even secondary results of infiltration.

With regard to the cause of this degeneration, writers generally have been content to assign the process to the injurious results of syphilis, tuberculosis, caries, chronic suppuration, and other exhausting diseases; but Dr Dickinson has sought to show that in a large majority of cases it depends upon only one of these causes,—viz., suppuration. This accomplished physician of course supports his theory with clinical evidence. He says, that “placing together the cases from both writers (Dr Wilks and myself), we have 109 in which the antecedent disease was traced; of these 83, or more than three-fourths, were consequent upon undoubted loss of pus, while in the remaining 26 the preceding disorders were of such a nature that it is not possible to doubt that at some period the same morbid discharges must have been present in the greater number.” He also gives an account of 60 cases observed by himself. In 46 there was evidence of a profuse and long-continued drain of pus, in 4 there was reason to suspect that purulent discharges had occurred of the remaining 10, 4 had suffered from severe albuminuria.

It seems best to test the view by analysing a series of cases which I had myself observed, in which the existence of the waxy disease was proved by post-mortem examination, and whose antecedent history was carefully recorded, and for the accuracy of which I am personally responsible. I find 18 such cases, a small number, but quite sufficient to test the accuracy of such a theory as that under consideration. Of these cases, 7 certainly, and 1 probably, were from syphilis, 4 were from tubercle of the lungs, 2 from caries of bone, 1 had suffered from chronic rheumatism, 1 was affected with cancer, and 2 stated that their illness had not been preceded by any particular disease. Of the syphilitic cases none had suffered from suppuration;

indeed only 6 of the 18 cases could be regarded as confirming Dr Dickinson's observations. This test is, in my opinion, crucial, for in all the cases I was minutely acquainted with the patients' history, and suppuration had occurred only in one-third of the whole number.

The points, then, that appear well established as to this affection are—*1st*, That it is a true degeneration or transformation of tissue, not an infiltration. *2d*, That it consists of an albuminous material, probably deficient in alkali. *3d*, That it results from long-continued exhausting diseases, such as syphilis, tuberculosis, caries, and chronic suppuration.

IV.

ON THE COMPLICATIONS OF THE DIFFERENT FORMS
OF BRIGHT'S DISEASE.

It has been suggested that the following statistical paper should have been embodied in the first edition of this work. I have introduced it in this edition, although there are many points which I could wish to improve. It is reprinted from the British and Foreign Medico-Chirurgical Review for 1867.

The present paper is intended as a contribution to our knowledge of the complications of Bright's Disease. Our first step must, therefore, be clearly to define our conception of what a complication is. In the widest sense, we may say that any disease co-existing with another is entitled to be so called. But experience has shown that certain diseases frequently co-exist, and that such are related as cause and effect, or as results of a common cause; these affections are, in a special sense, complications. But, further, it may be held that in strict accuracy the name should be confined to co-existing diseases, which, though frequently met with together, are essentially independent of each other, or are results of a common cause, and should not be applied to those which are consequences of others, such being regarded as part of the original disease—mere symptoms, and not truly complications. But, in accordance with the example of previous writers, and for practical convenience, I shall adhere to the second definition of the term, and shall so include some conditions which are undeniably mere symptoms, and others which might reasonably be held to be such. Of complications thus understood we recognise several varieties:—1. Some are results of a primary disease, as dropsy of cardiac,

renal, or hepatic affections — these are consequent complications. 2. Some are causes of the disease with which they co-exist, as bronchitis of emphysema, arterial degeneration of apoplexy — these are causal complications. 3. Some are results of a cause which they have in common with the disease which they complicate, as sore throat and periosteal nodes of syphilis — these are complications from a common cause. We must further bear in mind that while in many cases the relations between different complications are obvious and direct, in others they are obscure and indirect, and that it not infrequently happens that diseases co-exist without any special relationship existing between them at all.

In seeking to determine the frequency and importance of the complications of any disease, we must insist upon attention to the following points:—

1. That the two diseases co-exist in such a proportion of cases as cannot be explained on the theory of mere accidental concurrence.

2. That all cases be put out of consideration in which the complications may be referred to other causes.

3. That the supposed consequent complication be more frequent as the disease which is regarded as the cause advances or increases in severity.

To these principles I shall strictly adhere in the following paper.

This paper is, as I have said, intended as a contribution to our knowledge of the complications of Bright's Disease. It consists of an analysis of the cases examined post-mortem in the Royal Infirmary during a period of forty months. They are 131 in number, and the different forms occur in the following proportions:—Inflammatory form 51 cases, waxy 50, contracting 13, combined waxy and inflammatory 17. In order to make my results as reliable as possible, I have struck off in my calculations 23 examples of the inflammatory form in which death took place in the very earliest stage of the renal affection. It is apparent that the number of cases at my disposal is

much smaller than might have been wished ; but they have all been examined and recorded by myself, and are capable of affording at least a contribution towards a more accurate knowledge of the subject. I have given the results in per-centages—the only form in which we can conveniently grasp their meaning ; and for purposes of comparison I have reduced some tables by other authorities to the same standard. The fractions have been expressed only when they amount to one-fourth, one-half, or three-fourths of unity, for this I consider sufficiently accurate for all practical purposes.

The number and importance of the complications of Bright's Disease have been long recognised. Dr Christison, in his excellent work on this subject, published nearly thirty years ago, says—"The primary disease seldom continues long without other important diseases being super-added to it, and giving occasion to a great variety of additional symptoms ;" and he enumerates among them as secondary affections of most frequent occurrence :—dropsy, diarrhœa, pleurisy, peritonitis, pneumonia, catarrh, dyspepsia and chronic vomiting, coma with other affections of the head, chronic rheumatism, chronic diseases of the heart, and organic diseases of the liver.¹ Frerichs, writing in 1851, enumerates affections of the circulation, particularly cardiac hypertrophy ; of the lungs and air-passages, particularly œdema, pneumonia, vascular emphysema, and tubercle ; of the liver, fatty degeneration and cirrhosis ; of the spleen, hypertrophy ; of the stomach and intestines, chronic catarrh and occasionally ulceration ; of the central organs of the nervous system, apoplexy and serous effusions ; of the serous membranes, dropsies and inflammations ; and, lastly, occasional affections of the bones and skin.² He carefully analysed 292 cases recorded by Bright, Christison, Gregory, Martin Solon,

¹ Christison, "On Granular Degeneration of the Kidneys," p. 76.

² Frerichs, "Die Brightische Nierenkrankheit und deren Behandlung," p. 44.

Rayer, Becquerel, Bright and Barlow, Malmston, and himself; and from his tabulated results I have calculated the following per-centages:—

TABLE I.—*Showing the per centage of Affections accompanying Bright's Disease (Frerichs).*

HEART.		LUNGS.			LIVER.		SPLEEN.
Hypertrophy, without other known cause.	Congestion and Edema.	Pneumonia.	Emphysema.	Tubercle.	Cirrhosis.	Fatty Degeneration.	Enlargement.
33·75	25·5	9·5	7·5	12·5	8·5	6·5	8·5

STOMACH.	INTES- TINES.	NERVE CENTRES.		INFLAMMATION OF SEROUS MEMBRANES.		
Catarrh.	Catarrh.	Sanguineous Apoplexy.	Serous Effusion.	Pericardium.	Pleura.	Peri- toneum.
8·5	11·5	3·5	13·6	4·5	12·5	11·5

These results are valuable, as showing the complications of all the forms of Bright's Disease; but they throw no light on the different forms or their stages. M. Paul Lorain³ mentions, in addition to the above-named complications, amaurosis and cephalalgia, which he has found of frequent occurrence. In a valuable paper in the "Medico-Chirurgical Transactions," Dr Dickinson gives the results of 369 cases of Bright's Disease examined post-mortem in St George's Hospital.⁴ He distinguishes two forms of disease—nephritis and granular degeneration. I subjoin a copy of his table.

³ "De l'Albuminurie," par Paul Lorain, M.D., Paris, 1860.

⁴ "Medico-Chirurgical Transactions," vol. iv, 1861.

TABLE II.—*Showing the per centage of Affections accompanying each Renal Disorder (Dickinson).*

	NEPHRITIS (119 Cases).	GRANULAR DEGENERATION (250 Cases).
Bronchitis . . .	18·5	22·0
Diarrhœa . . .	20·1	11·6
Vomiting . . .	26·0	15·6
Pleurisy . . .	64·3	60·8
Pericarditis . . .	27·7	32·8
Peritonitis . . .	25·2	13·6
Pneumonia . . .	20·1	12·4
Œdema . . .	66·3	48·0
Ascites . . .	33·6	26·0
Hydrothorax . . .	28·5	25·2
Hydropericardium . . .	24·3	14·0
Epistaxis . . .	0·8	0·8
Erysipelas . . .	15·9	6·8
Cirrhosis of Liver . . .	10·9	15·2
Atheroma . . .	21·8	52·4
Hypertrophy of Heart . . .	24·3	48·0
Valvular Disease . . .	17·4	43·2
Convulsions . . .	10·9	5·6
Simple Coma . . .	10·0	8·8
Sanguineous Apoplexy . . .	2·5	6·8

The large number of facts here tabulated renders this very valuable; but as the cases have not been subdivided according to the classification of Virchow, now almost universally acknowledged to be correct, further information must be sought. Rosenstein⁵ distinguishes between the different forms, and enumerates among the results of what he terms the diffuse nephritis (which very much corresponds to Virchow's parenchymatous nephritis and my inflammatory form), dropsy, hypertrophy of the left ventricle of the heart, gastric disorder, nervous symptoms, uræmia, retinitis, bronchial catarrh, pericarditis, pleuritis, pneumonia, and peritonitis. He gives the following results of 114 cases collected by himself:—

⁵ "Die Pathologie und Therapie der Brightischen Nierenkrankheiten," von Dr. Rosenstein. Berlin, 1863.

Pneumonia was present in	.	.	.	17 per cent.
Pleurisy	.	.	.	16 „
Peritonitis	.	.	.	8 „
Pericarditis	.	.	.	7 „
Mediastinitis	.	.	.	2 „

In regard to the waxy or amyloid form, he states that dropsy is *common*, occurring *in 61 out of 72 cases*, but that its amount varies—a statement which the sequel will disprove; that among the symptoms connected with digestion frequent diarrhœa is to be mentioned; that secondary inflammations of serous membranes and parenchymatous organs occur, but less frequently, and among them all that peritonitis is the most prominent; that in advanced conditions, hypertrophy of left ventricle of heart, uræmia, and retinitis occur. Among the causes he reckons chronic tubercular disease of the lungs, long continued suppurations, syphilis, and obstinate intermittent fevers.

Of the gouty or contracting form he says nothing.

From these statements it is evident that the complications of Bright's Disease generally, and the frequency with which they occur, are pretty well ascertained, but that there is room for more exact information as to the complications of the individual forms and of their stages. The present paper is intended as a contribution towards the supply of this want. Being drawn from pathological observations, it is defective in respect of some points of clinical interest; but it is, on the other hand, I think, peculiarly trustworthy as to the internal lesions. I would gladly have added these points of clinical importance, but find that my notes are so defective as not to enable me to do so.

The following Table shows the proportionate frequency of the different complications in each of the forms of the disease:—

TABLE III.—*Showing the Chief Complications of the Different Forms of Bright's Disease.*

	Number of Cases.		Dropsy.	HYPERTROPHY OF HEART			LUNGS AND BRONCHI.			INFLAMMATIONS OF SEROUS MEMBRANES.						LIVER.				SPLEEN.		INTES-TINE.		BRAIN.
	Total.	Otherwise ex-plained.		Kidney sole Cause.	Congestion and Edema.	Pneumonia.	Tubercle.	Pericard.	Total.	Independ. of M.B.	Total.	Pleura.	Perito-neum.	Fatty.	Waxy.	Waxy and Fatty Degeneration.	Cirrhosis.	Waxy Degenera-tion.	Capsule Thickened.	Waxy Degenera-tion.	Tubercle.	Sanguineous Apo-plexy.		
Inflam. form	28	67.75	57.0	17.75	39.25	64.0	21.25	7.0	7.0	0	17.75	3.5	3.5	3.5	25.0	0	14.0	0	0	0	0	3.5	7.0	
Waxy or Amy-loid	50	6.0	12.0	8.0	4.0	20.0	4.0	48.0	8.0	0	6.0	4.0	6.0	6.0	32.0	46.0	74.0	0	58.0	18.0	2.0			
Contracting	13	23.0	53.75	7.5	46.25	53.75	7.5	23.0	7.5	0	15.25	0	0	0	15.25	0	15.25	0	38.25	0	15.25	15.25		
Inflam. & Waxy combined	17	47.0	0	0	0	29.25	0	52.75	...	17.5	0	0	0	0	5.75	23.5	52.75	5.75	88.0	0	52.75	17.5	0	
Peculiar Cases fatal in early stage	23	0	4.25	4.25	0	73.75	21.5	4.25	8.5	30.25	30.25	4.25	4.25	4.25	13.0	0	0	0	0	0	0	0	0	
Total Inflam.	51	37.0	33.0	11.0	0	68.5	21.5	5.75	3.75	23.25	15.5	3.75	3.75	3.75	19.5	0	7.75	0	0	0	1.75	3.75		

I propose to take up the different complications in succession, and to explain the facts given in the tables with regard to them.

I. *Dropsy*.—This is well known to be specially associated with the inflammatory form, and these tables confirm the accuracy of the opinion, for they show that it was present at the time of death in 37 per cent of all my inflammatory cases;—or, if we subtract the peculiar cases which died in the earliest stage, and leave only those which would be recognised as examples of Bright's Disease by all pathologists—in 67 per cent. of them; while in the waxy it was present in only 6 per cent., and in the contracting in 23. Moreover, of the cases in which inflammation of the tubules was superadded to waxy degeneration, it was present in 47 per cent.; and thus a relationship between this symptom and disease of the tubules is clearly demonstrated. But if it were possible to follow out the clinical history of my cases, I am satisfied that this relationship would be found even more striking, for a considerable proportion of people who have been affected with inflammatory Bright's Disease die of diseases unconnected with the kidneys; while the renal malady, being in a quiescent state, is not attended by its characteristic symptoms, and so on post-mortem examination they are wanting. In contrasting the different forms I have merely referred to the frequency, not to the severity, of the accompanying dropsy; but it may be well to state that inflammatory cases are not only the most frequently dropsical, but the most severely so. Now, in regard to the waxy form, my results differ very strikingly from the statements of Rosenstein, for he found dropsy in 61 out of 72 of his waxy cases; and the only explanation of the discrepancy which occurs to me is, that he has included all cases in which any waxy degeneration existed, thus bringing in those of combined waxy and inflammatory, which of course have dropsy. This explanation is borne out by many other considerations.

It is further interesting to note the relationship of dropsy to the different *stages* of the inflammatory form, as shown in the following Table :—

TABLE IV.—*Showing the Relations of Dropsy to the Stages of the Inflammatory Form.*

Stage 1st,	.	.	.	25·0 per cent.
„ 2d,	.	.	.	84·5 „
„ 3d,	.	.	.	85·5 „

Thus it appears that as the case advances to a fatal termination the frequency of dropsy increases; for while it was present in but 25 per cent. of the fatal in the first stage, it was in 84 of those in the second, and 85 of those in the third. But even the first stage cannot long exist without dropsy being developed, and its comparative rarity in my cases is explained by the fact that some of the patients died of erysipelas, scarlatina, or similar diseases, before the renal affection had advanced sufficiently to induce dropsy.

II. *Hypertrophy of Heart.*—This is a frequent complication, and occurs with all the forms, though chiefly with the inflammatory and contracting. In not a few cases, however, it depends, in part at least, upon causes other than renal, *e.g.*, valvular disease, atheroma of vessels; but in a considerable proportion Bright's Disease is the only apparent cause, and doubtless in all it exerts some influence. I have met with it in 57 per cent. of the inflammatory form, 12 per cent. of the waxy, and 53 per cent. of the contracting; but of these, 17 per cent. of the inflammatory, 8 per cent. of the waxy, and 7 per cent. of the contracting, had other causes. There remain still, however, a considerable proportion of cases in which the sole cause was in the kidneys, *viz.*, 39 per cent. of the inflammatory, 4 per cent. of the waxy, and 46 per cent. of the contracting. Frerichs had found this complication in 33 per cent. of all his cases; Dickinson in 24 per cent. of his

cases of nephritis, and in 48 per cent. of his cases of granular degeneration; and Rosenstein states that it is common in the diffuse nephritis, and occurs in advanced conditions of the waxy.

As the disease advances, the tendency to this complication increases, as is shown by the following Table:—

TABLE V.—*Showing the relation of Cardiac Hypertrophy to the Stages of the Forms.*

	Per cent.				Per cent.		
	Stage	1st,	. 12·5		Stage	1st,	. 0
Inflamm. form {	"	2d,	. 38·5	Waxy form {	"	2d,	. 0
	"	3d,	. 100		"	3d,	. 5·9

Here it appears that in the first stage 12 per cent. had cardiac hypertrophy without other known cause, in the second stage 38, and in the third 100 per cent.

This last fact is certainly very curious. The only explanation which suggests itself to me is, that if important disease of the valves or vessels coexist with Bright's Disease, the patient seldom lives long enough to reach the third stage of that malady. My observations amply confirm Rosentein's statement, both with regard to the inflammatory and waxy forms. And it is interesting to notice how exactly this complication possesses the qualities which I have insisted on as characteristic of the true consequent complications.

III. *Affections of Lungs and Bronchi.*—Three pulmonary diseases occur not unfrequently in combination with Bright's Disease, viz., congestion and œdema of the lungs and bronchi, pneumonia, and tubercle. We shall consider each of them in succession.

1. *Congestion and œdema of lungs and bronchi.*—This is a common complication of all the forms, and constitutes, indeed, a common fatal termination. It may be acute, developing with great rapidity; or it may be chronic, slowly and insidiously increasing. It is most common in association with the inflammatory and contracting forms,

less so with the waxy, and the addition of the inflammatory to the waxy increases its frequency. It existed in 64 per cent. of my inflammatory cases, 53 per cent. of the contracting, and only 20 per cent. of the waxy, while of the combined waxy and inflammatory in 29 per cent. According to my tables, the frequency of this complication is much greater than the observations of Frerichs would make it, for he found it in only 25 per cent. of his cases. On the other hand, bronchitis is regarded as a frequent complication by some writers, though I have found a truly inflammatory condition of the bronchi exceedingly rare. That mucus or muco-serous fluid is frequently present in quantity is certainly true, and the existence of this fluid of course produces the symptoms and physical signs of bronchitis; but this is connected with œdema rather than inflammation, for I have found that in almost every instance a healthy or simply congested condition of the mucous membrane was found when the mucus had been washed off by a stream of water. We find that this complication is most frequent in the first and third stages of the inflammatory, and the more advanced conditions of the waxy and contracting, as is shown in the following Table:—

TABLE VI.—*Showing the relations of Pulmonary Congestion and Œdema to the Stages of the Inflammatory Form.*

Inflam. form	Per cent.		Waxy form	Per cent.		Con- tracting form	Per cent.	
	Stage 1st,	75·0		Stage 1st,	0		Early stage,	0
	" 2d,	46 0		" 2d,	20		Advanced,	53·75
	" 3d,	85·5		" 3d,	20			

2. *Pneumonia*.—Inflammation of the lungs coexists with Bright's Disease in a considerable number of cases. It was present in 21 per cent. of the inflammatory, 4 per cent. of the waxy, and 7 per cent. of the contracting cases. But it appears to me very doubtful whether any really important relationship exists between them. Frerichs found it in only 9 per cent. of his cases, and Dickinson in

20 per cent. of his tubular, and 12 per cent. of his inter-tubular.

Moreover, when we refer to the stages at which it occurred, we find that it is as frequent, or even more so, in the early as in the later, as is shown in the following Table:—

TABLE VII.—*Showing the relation of Pneumonia to the Stages of the Forms.*

Inflam. form	{	Stage 1st, 12·5 per cent.		||	Waxy form	{	Stage 1st, 22 per cent.
		„ 2d, 30·0	„				„ 2d, 0
		„ 3d, 11·0	„				„ 3d, 0

This table shows that with the waxy it was found only in cases in the first stage. With the inflammatory it was most frequent in the second, and about equally common in the first and third. Now, if it were an affection really resulting from Bright's Disease, we should expect that as that malady advances it would increase in frequency, and this is not the case.

3. *Tubercle*.—This affection of the lungs is shown to be peculiarly related to the waxy form, for while it was present in only 7 per cent. of the inflammatory and 23 per cent. of the contracting, it existed in 48 per cent. of the waxy, and in 52 per cent. of the combined waxy and inflammatory. There can be little doubt that these affections often depend upon a common cause, such as constitutional syphilis; but it is certain that while tubercle rarely becomes super-added to Bright's Disease, that disease is very frequently superadded to tubercle. When this occurs I have generally found the renal affection to be of the combined waxy and inflammatory form.

TABLE VIII.—*Showing the relation of Tubercle of Lungs to the Stages of the Forms.*

Inflam. form	{	Stage 1st, 12·5 per cent.		||	Waxy form	{	Stage 1st, 66·5 per cent.
		„ 2d, 15·5	„				„ 2d, 60·0
		„ 3d, 0	„				„ 3d, 35·25

In this case it is very manifest how important the relationship is in the earlier stages, and how in all the forms the frequency diminishes as the case advances.

IV. *Inflammation of Serous Membranes.*—These affections have been commonly regarded as among the most serious and fatal of the complications of Bright's Disease. Dr Watson says—"Intercurrent acute inflammation is not an uncommon cause of the patient's death. The pleura appears to be much more often affected in this manner than either the peritoneum or the pericardium."⁶ Frerichs' cases give the following results:—Pleurisy was present in 12 per cent., peritonitis in 11 per cent., and pericarditis in 4 per cent. Dr Dickinson found the affection much more frequent, pleurisy occurring in 64 per cent. of cases of nephritis, in 60 per cent. of cases of granular degeneration; peritonitis in 25 per cent. of the former, 13 per cent. of the latter; pericarditis in 27 per cent. of the former, and 32 per cent. of the latter. Rosenstein, again, found pleurisy in 16 per cent., peritonitis in 8 per cent., and pericarditis in 7 per cent. of his cases of diffuse nephritis; and he states generally that with the waxy degeneration the same affections occur, but less frequently.

Thus, a remarkable discrepancy exists between the results of Dr Dickinson's London experience and that of the German experiences of Rosenstein, and the collated German, British, and French results of Frerichs. My observations accord more with those of Frerichs and Rosenstein than with those of Dickinson, for I find that with the inflammatory form I had 17 per cent. of pleurisy, 7 per cent. of pericarditis, and 3 per cent. of peritonitis; but that in a considerable number of the cases of pleurisy, and in all those of peritonitis, the inflammation manifestly resulted from other causes. With the waxy I had 6 per cent. of pleurisy, 8 per cent. of pericarditis, and 6 per cent. of peritonitis; and here, again, many of the cases were

⁶ Watson's "Practice of Physic," 4th edit., vol. ii, p. 682.

distinctly referable to other causes. With the contracting I had 15 per cent. of pleurisy, 7 per cent. of pericarditis, and no case of peritonitis.

Thus, we had of inflammatory cases, not proved to depend upon causes other than the renal disease, 14 per cent. of pleurisy, 7 per cent. of pericarditis, and no peritonitis. But when we further inquire into the stages of the renal disease at which the complication appeared, we find that the inflammations are connected with the earlier stages rather than the later. It is shown in the following Table:—

TABLE IX.—*Showing the relation of Serous Inflammations to the Stages of the Inflammatory Form.*

	PLEURISY.	PERICARDITIS.	PERITONITIS.
	Per cent.	Per cent	Per cent.
Stage 1st . . .	7·0	7·0	0
2d . . .	3·0	0	0
3d . . .	3·0	0	0

Now, it is singular that so large a proportion of the cases of pleurisy, and that all the cases of pericarditis, should have occurred in the first stage. If this inflammatory affection of the kidneys was the cause, we would rather have expected that as the renal affection advanced the frequency of such inflammations should have increased.

But, again, when we turn to the waxy cases, we find that only 2 per cent. of the cases had pleurisy, 8 per cent. had pericarditis, and 2 per cent. peritonitis, which were not proved to depend upon causes other than Bright's Disease. On referring to the stages, we find that all the cases of pleurisy co-existed with the first stage; that in one case of pericarditis the stage was not recorded, but that the other cases, amounting to 6 per cent., occurred in the last stage, as is shown in the following Table:—

TABLE X.—*Showing the relation of Serous Inflammations to the Stages of the Waxy Form.*

	PLEURISY.	PERICARDITIS.	PERITONITIS.
	Per cent.	Per cent.	Per cent.
Stage 1st . . .	2	0	0
2d . . .	0	0	0
3d . . .	0	6	0

It is evident that these results give no countenance to the opinion that waxy degeneration is a cause of pleurisy or peritonitis; and with regard to pericarditis, while the facts recorded are reconcilable with the view commonly held, it cannot be asserted that they strongly support it.

Turning now to the contracting form, we find that pleurisy occurred in 15 per cent., pericarditis in 7, peritonitis in none, and all the cases were in the later stages of the malady. But it must be borne in mind that the number of cases of this affection was small, and that when the inflammation existed, though it could not be proved to depend upon other causes, it did not appear closely connected with this, a remark which applies also to the other forms.

With the view of testing the question, Whether these serous inflammations may not be accidental coincidences, rather than true complications? I have examined the reports of my last twenty-five cases of aneurysm of the aorta and cancer of the stomach (diseases which are not supposed specially connected with serous inflammation), and calculated the per-centage of serous inflammations accompanying them. The results are shown in the following Table, along with the exact results in my three forms. I have, of course, here as elsewhere, carefully separated such cases as owed their serous inflammation to some definite cause :—

TABLE XI.—*Showing the frequency of Serous Inflammations in cases of Aortic Aneurysm, &c.*

	PLEURISY.	PERICARDITIS.	PERITONITIS.
	Per cent.	Per cent.	Per cent.
Aortic Aneurysm . .	8·0	0	0
Cancer of Stomach . .	12·0	0	8
Inflam. Bright's Disease	14·0	7·0	0
Waxy ...	2·0	6·0	0
Contracting ...	15·0	7·0	0

From this table it is evident that inflammation of the pleura is somewhat more frequent in nephritis and cirrhosis of the kidney than it is in cancer of the stomach or aortic aneurysm, but in a proportion by no means important; that, on the other hand, pericarditis is more common in all the forms of Bright's Disease than it is in either of the other diseases investigated; while peritonitis is absent in all the cases except cancer of the stomach, in which it occurs occasionally independently of perforation or other direct and obvious cause.

From these facts I conclude that the frequency of intercurrent fatal attacks of acute inflammation of serous membranes has been greatly exaggerated; that they are certainly not to be regarded as consequent complications, and that it is very doubtful whether any relationship exists between Bright's Disease and this, unless it be that they may sometimes depend upon a common cause. It may be that intercurrent attacks of such inflammations of a slighter kind do occur, but if so, the evidence must be afforded by the clinical physician rather than by the pathologist, and such evidences I have myself hitherto sought in vain.

V. *Diseases of the Liver.*—I have tabulated the results in regard to four affections of this origin, viz., *fatty degeneration, waxy degeneration, fatty and waxy degeneration combined, and cirrhosis.* The *fatty degeneration* is

most common in the inflammatory form (25 per cent.), next in the contracting (15 per cent.), and least in the waxy (6 per cent.). The *waxy degeneration* occurs only along with the waxy and combined waxy and inflammatory, and that in 32 per cent. of the former and 23 per cent. of the latter. The *combined waxy and fatty degenerations* occurred also only with the waxy and combined waxy and inflammatory, and was met with in 46 per cent. of the former and 52 per cent. of the latter. *Cirrhosis* co-existed most frequently with the contracting (15 per cent.), somewhat less frequently with the inflammatory (14 per cent.), and in no case with the waxy.

These results strikingly bear out the opinions generally held, that the liver and the kidneys are frequently the seats of the same lesions, each form of disease in the kidneys being specially associated with a similar affection of the liver. But though such association is frequent, it does not appear that one is the result of the other—rather that both are the result of a common cause.

VI. *Diseases of the Spleen.*—Two morbid conditions of this organ commonly co-exist with Bright's Disease, viz., waxy degeneration and thickening of the capsule. The *waxy* degeneration occurred only with the waxy and the combined waxy and inflammatory forms in 74 per cent. of the former, and 88 per cent. of the latter. *Thickening of the capsule* existed only with the contracting cases, and then in 38 per cent.

Of these affections, too, it is evident that they depend upon a common cause, and are not otherwise connected with one another.

VII. *Diseases of the Alimentary Tract.*—Of the affections of this tract I have tabulated only two as being frequent complications of Bright's Disease, viz., *waxy degeneration* and *tuberculosis*. The *waxy degeneration*, which is most common in the villi of the small intestine and in the stomach, but occurs by no means infrequently

in the large intestine, I have found to accompany only the waxy and combined waxy and inflammatory forms, and that in 58 per cent. of the former, and 52 per cent. of the latter. *Tubercular deposit and ulceration*, occurring most commonly in the lower part of the small intestine, but also sometimes in the large, co-exists with all the forms, but especially with the waxy (18 per cent.), the waxy and inflammatory combined (17 per cent.). It is somewhat less common with the contracting (15 per cent.), and is most rare with the inflammatory (3 per cent.).

With regard to these, also, it is plain that no special causal relation can exist, unless, perhaps, in the case of the waxy degeneration resulting from tubercle of the intestine. But this I think very doubtful.

VIII. *Diseases of the Brain*.—The affections of this organ which have been most commonly recognised as complications are *sanguineous* and the so-called *serous apoplexies*. But I confine my attention to the former class, having found, like most other recent pathologists, that the anatomical conditions which used to be regarded as characteristic of serous apoplexy are commonly met with in diseases accompanied with no apoplectic symptoms, and are not always to be found in cases whose clinical history might lead us to expect them.

Sanguineous apoplexy occurs as a fatal termination in a certain proportion of cases of all the forms. It is most frequent in the contracting (15 per cent.), next in the inflammatory (7 per cent.), and least in the waxy (2 per cent.).

In relation to the stages, we find that this lesion presents the characteristics of a consequent complication, as is shown in the following Table:—

TABLE XII.—*Showing the relations of Apoplexy to the Stages of the different Forms.*

Inflam. form	{	Stage 1st,	0 per cent.	||	Waxy form	{	Stage 1st,	0 per cent.
		" 2d,	7.5				" 2d,	0
		" 3d,	14.0				" 3d,	5.0

These facts show clearly that as the disease advances the complication becomes more frequent.

From the facts which we have adduced it is evident that among the consequent complications we may reckon with certainty dropsy, which, of course, is more correctly regarded as a symptom than a complication; congestion and œdema of the lung; hypertrophy of the heart; and sanguineous apoplexy. Among causal complications of the waxy and combined waxy and inflammatory forms we may reckon tubercle of the lungs. The others are regarded as results of a cause common to them and Bright's Disease, or as slightly connected or unconnected with the renal diseases. I hope one day to add further pathological and clinical information on the question we have here considered.

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